DIGITAL Can OBD2 Scan Tool

OWNER'S MANUAL

The Easiest And Best Way To Troubleshoot 1996 and Newer OBD2 Vehicles!

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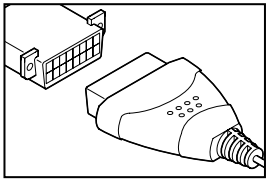
WHAT IS OBD?

The Enhanced OBD2 Scan Tool is designed to work on all OBD2 compliant vehicles. All 1996 and newer vehicles (cars, light trucks and SUVs) sold in the United States are OBD2 compliant.

One of the most exciting improvements in the automobile industry was the addition of on-board diagnostics (OBD) on vehicles, or in more basic terms, the computer that activates the vehicle's "CHECK ENGINE" light. OBD1 was designed to monitor manufacturer-specific systems on vehicles built from 1981 to 1995. Then came the development of OBD2, which is on all 1996 cars and light trucks sold in the U.S. Like its predecessor, OBD2 was adopted as part of a government mandate to lower vehicle emissions. But what makes OBD2 unique is its universal application for all late model cars and trucks - domestic and import. This sophisticated program in the vehicle's main computer system is designed to detect failures in a range of systems, and can be accessed through a universal OBD2 port, which is usually found under the dashboard. For all OBD systems, if a problem is found, the computer turns on the "CHECK ENGINE" light to warn the driver, and sets a Diagnostic Trouble Code (DTC) to identify where the problem occurred. A special diagnostic tool, such as the Enhanced OBD2 Scan Tool, is required to retrieve these codes, which consumers and professionals use as a starting point for repairs.

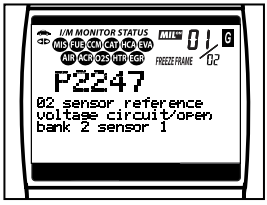
The Enhanced OBD2 Scan Tool provides the additional ability to retrieve *enhanced* DTCs from most Chrysler/Jeep, General Motors, Ford, Mazda and Isuzu vehicles. The types of enhanced data available depends on the vehicle make. Chrysler/Jeep, Ford/Mazda, GM/Izusu, Honda/Acura and Toyota/Lexus vehicles, as well as Anti-Lock Brake System (ABS) DTCs and vehicle information. The types of enhanced data available depends on the vehicle make.

Easy To Use . . . .



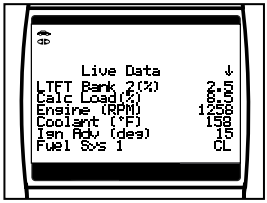
- Connect the Scan Tool to the vehicle's test connector.
- Turn the ignition key "On."
- Press the **LINK** button.

Easy To View . . . .



- The Scan Tool retrieves stored codes, Freeze Frame data and I/M Readiness status.
- Codes, I/M Readiness status and Freeze Frame data are displayed on the Scan Tool's display screen. System status is indicated by LED indicators.

Easy To Define . . . .



- Read code definitions from the Scan Tool's display.
- View Freeze Frame data.
- View Live Data.

SAFETY FIRST!

To avoid personal injury, instrument damage and/or damage to your vehicle; do not use the OBD2 Scan Tool before reading this manual.

This manual describes common test procedures used by experienced service technicians. Many test procedures require precautions to avoid accidents that can result in personal injury, and/or damage to your vehicle or test equipment. Always read your vehicle's service manual and follow its safety precautions before and during any test or service procedure. **ALWAYS** observe the following general safety precautions:

When an engine is running, it produces carbon monoxide, a toxic and poisonous gas. To prevent serious injury or death from carbon monoxide poisoning, operate the vehicle **ONLY** in a **well-ventilated** area.

To protect your eyes from propelled objects as well as hot or caustic liquids, **always** wear **approved** safety eye protection.

When an engine is running, many parts (such as the coolant fan, pulleys, fan belt etc.) turn at high speed. To avoid serious injury, always be aware of moving parts. Keep a safe distance from these parts as well as other potentially moving objects.

Engine parts become very hot when the engine is running. To prevent severe burns, avoid contact with hot engine parts.

Before starting an engine for testing or troubleshooting, make sure the parking brake is engaged. Put the transmission in **park** (for automatic transmission) or **neutral** (for manual transmission). Block the drive wheels with suitable blocks.

Connecting or disconnecting test equipment when the ignition is **ON** can damage test equipment and the vehicle's electronic components. Turn the ignition **OFF** before connecting the Scan Tool to or disconnecting the Scan Tool from the vehicle’s Data Link Connector (DLC).

To prevent damage to the on-board computer when taking vehicle electrical measurements, always use a digital multimeter with at least 10 megOhms of impedance.

Fuel and battery vapors are highly flammable. To prevent an explosion, keep all sparks, heated items and open flames away from the battery and fuel / fuel vapors. DO NOT SMOKE NEAR THE VEHICLE DURING TESTING.

Don't wear loose clothing or jewelry when working on an engine. Loose clothing can become caught in the fan, pulleys, belts, etc. Jewelry is highly conductive, and can cause a severe burn if it makes contact between a power source and ground.

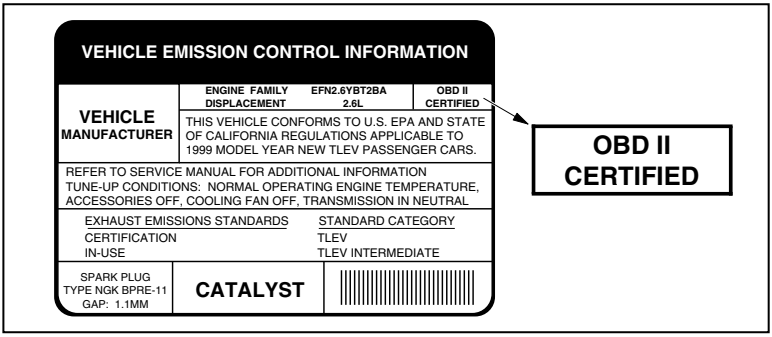
VEHICLES COVERED

The Enhanced OBD2 Scan Tool is designed to work on all OBD2 compliant vehicles. All 1996 and newer vehicles (cars and light trucks) sold in the United States are OBD2 compliant.

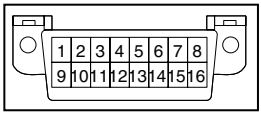
Federal law requires that all 1996 and newer cars and light trucks sold in the United States must be OBD2 compliant; this includes all Domestic, Asian and European vehicles.

Some 1994 and 1995 vehicles are OBD2 compliant. To find out if a 1994 or 1995 vehicle is OBD2 compliant, check the following:

1. **The Vehicle Emissions Control Information (VECI) Label**. This label is located under the hood or by the radiator of most vehicles. If the vehicle is OBD2 compliant, the label will state "**OBD II Certified**."


VEHICLE EMISSION CONTROL INFORMATION
ENGINE FAMILY EFN2.6YBT2BA
DISPLACEMENT 2.6L
OBD II CERTIFIED
VEHICLE MANUFACTURER
THIS VEHICLE CONFORMS TO U.S. EPA AND STATE OF CALIFORNIA REGULATIONS APPLICABLE TO 1999 MODEL YEAR NEW TLEV PASSENGER CARS.
REFER TO SERVICE MANUAL FOR ADDITIONAL INFORMATION
TUNE-UP CONDITIONS: NORMAL OPERATING ENGINE TEMPERATURE, ACCESSORIES OFF, COOLING FAN OFF, TRANSMISSION IN NEUTRAL
EXHAUST EMISSIONS STANDARDS
STANDARD CATEGORY
CERTIFICATION
TLEV
IN-USE
TLEV INTERMEDIATE
SPARK PLUG TYPE NGK BPRE-11 GAP: 1.1MM
CATALYST
OBD II CERTIFIED

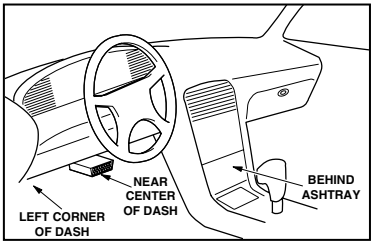
2. Government Regulations require that all OBD2 compliant vehicles **must** have a "common" sixteen-pin **Data Link Connector (DLC)**.



Some 1994 and 1995 vehicles have 16-pin connectors but are not OBD2 compliant. Only those vehicles with a Vehicle Emissions Control Label stating "OBD II Certified" are OBD2 compliant.

Data Link Connector (DLC) Location

The 16-pin DLC is usually located under the instrument panel (dash), within 12 inches (300 mm) of center of the panel, on the driver's side of most vehicles. It should be easily accessible and visible from a kneeling position outside the vehicle with the door open.



On some Asian and European vehicles the DLC is located behind the "ashtray" (the ashtray must be removed to access it) or on the far left corner of the dash. If the DLC cannot be located, consult the vehicle's service manual for the location.

BATTERY REPLACEMENT

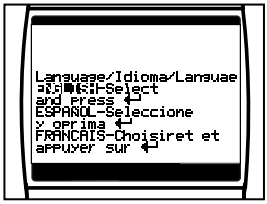
Replace batteries when the battery symbol is visible on display and/or the 3 LEDS are all lit and no other data is visible on screen.

1. Locate the battery cover on the back of the Scan Tool.
2. Slide the battery cover off (use your fingers).
3. Replace batteries with three AA-size batteries (for longer life, use Alkaline-type batteries).
4. Reinstall the battery cover on the back of the Scan Tool.

Language Selection After Battery Installation

The first time the Scan Tool is turned on, you must select the desired display language (English, French or Spanish). Select the display language as follows:

1. Press and hold the **POWER/LINK** button for approximately 3 seconds to turn the Scan Tool "ON."
   - The Select Language screen displays.



2. Use the **UP** and **DOWN** buttons, as necessary, to highlight the desired display language.
3. When the desired display language is selected, press the **ENTER/LD** button to confirm your selection.
   - The display shows the "To Link" message in the selected display language. Press the **POWER/LINK** button to turn the Scan Tool "off."
   - After the initial language selection is performed, it as well as other settings can be changed as desired. See ADJUSTMENTS AND SETTINGS on page 7 for further instructions.

ADJUSTMENTS AND SETTINGS

The OBD2 Scan Tool lets you make several adjustments and settings to configure the Scan Tool for your particular needs. The following adjustments and settings are available:

- **Adjust Brightness**: Adjusts the brightness of the display screen.
- **DTC Library** - Library of OBD2 DTC definitions.
- **Display Backlight:** Turns the display backlight on and off.
- **Select Language**: Sets the display language for the Scan Tool to English, French or Spanish.
- **Unit of Measurement**: Sets the Unit of Measurement for the Scan Tool's display to USA or metric.

Adjustments and settings can be made only when the Scan Tool is NOT connected to a vehicle.

To enter the MENU Mode:

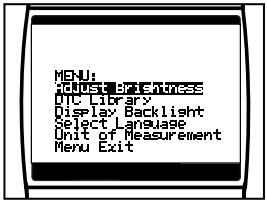
1. With the Scan Tool "off", press and hold the **UP** button, then press and release the **POWER/LINK** button.
   - The adjustments and setting MENU displays.
2. Release the **UP** button.

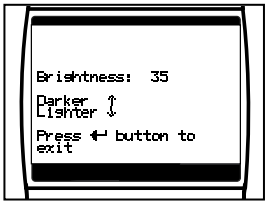
*DO NOT release the **UP** button until the adjustments and settings **MENU** is visible on the display.*

3. Make adjustments and settings as described in the following paragraphs.

Adjusting Display Brightness

1. Use the **UP** and **DOWN** buttons, as necessary, to highlight **Adjust Brightness** in the **MENU**, then press the **ENTER/LD** button.
   - The Adjust Brightness screen displays.
   - The **Brightness** field shows the current brightness setting, from 0 to 43.
2. Press the **UP** button to decrease the brightness of the display (make the display darker).





3. Press the **DOWN** button to increase the brightness of the display (make the display lighter).

4. When the desired brightness is obtained, press the **ENTER/LD** button to save your changes and return to the **MENU**.

Searching for a DTC Definition Using the DTC Library

1. Use the **UP** and **DOWN** buttons, as necessary, to highlight **DTC Library** in the **MENU**, then press the **ENTER/LD** button.

   - The Enter DTC screen displays. The screen shows the code "P0001", with the "P" flashing.

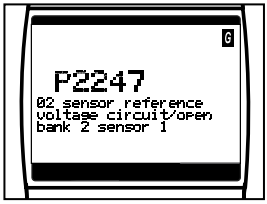
2. Use the **UP** and **DOWN** buttons, as necessary, to scroll to the desired DTC type (P=Powertrain, U=Network, B=Body, C=Chassis), then press the **DTC SCROLL** button.

   - The selected character displays "solid", and the next character begins flashing.

3. Select the remaining characters in the DTC in the same way, pressing the **DTC SCROLL** button to confirm each character. When you have selected all the DTC characters, press the **ENTER/LD** button to view the DTC definition.

   - If you entered a "Generic" DTC (DTCs that start with "P0", "P2" and some "P3"):

     - The selected DTC and DTC definition (if available) show on the Scan Tool's display.



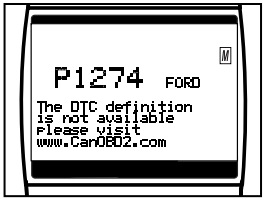
If a definition for the DTC you entered is not available, the "To Link" screen displays.

   - If you entered a "Manufacturer-Specific" DTC (DTCs that start with "P1" and some "P3"):

     - The "Select Manufacturer" screen displays.

     - Use the **UP** and **DOWN** buttons, as necessary, to highlight the appropriate manufacturer, then press the **ENTER/LD** button to display the correct DTC for your vehicle.

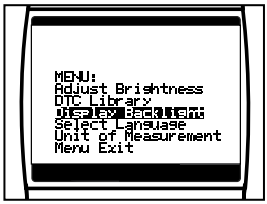
If a definition for the DTC you entered is not available, an advisory message shows on the CanOBD2 Scan Tool's display.

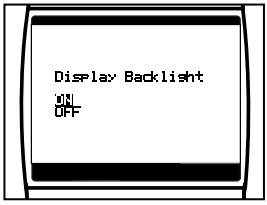


4. If you wish to view definitions for additional DTCs, press the **ENTER/LD** button to return to the Enter DTC screen, and repeat steps 2 and 3.
5. When all desired DTCs have been viewed, press the **ERASE** button to exit the DTC Library.

Using the Backlight

1. Use the **UP** and **DOWN** buttons, as necessary, to highlight **Display Backlight** in the **MENU**, then press the **ENTER/LD** button.
   - The Display Backlight screen displays.
2. Press the **UP** or **DOWN** button, as necessary, to select the desired backlight mode, either **ON** or **OFF**.
3. When the desired backlight mode is selected, press the **ENTER/LD** button to save your changes.
   - The display returns to the **MENU**, and the backlight turns "on" or "off" as selected.





Selecting the Display Language

1. Use the **UP** and **DOWN** buttons, as necessary, to highlight Select Language in the MENU, then press the **ENTER/LD** button.
   - The Select Language screen displays.
   - The currently selected display **Language** is highlighted.
2. Press the **UP** or **DOWN** button, as necessary, to highlight the desired display language.
3. When the desired display language is highlighted, press the **ENTER/LD** button to save your changes and return to the **MENU** (shown in the selected display language).

Setting the Unit of Measurement

1. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight **Unit of Measurement** in the **MENU**, then press the **ENTER/LD** ↵ button.
2. Press the **UP** ⏶ or **DOWN** ⏷ button, as necessary, to highlight the desired **Unit of Measurement**.
3. When the desired **Unit of Measurement** value is selected, press the **ENTER/LD** ↵ button to save your changes.

Exiting the MENU Mode

1. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight **Menu Exit** in the **MENU**, then press the **ENTER/LD** ↵ button.
   - The display returns to the DTC screen (if data is currently stored in the Scan Tool) or to the "To Link" message (if no data is currently stored in the Scan Tool).

CONTROLS AND INDICATORS

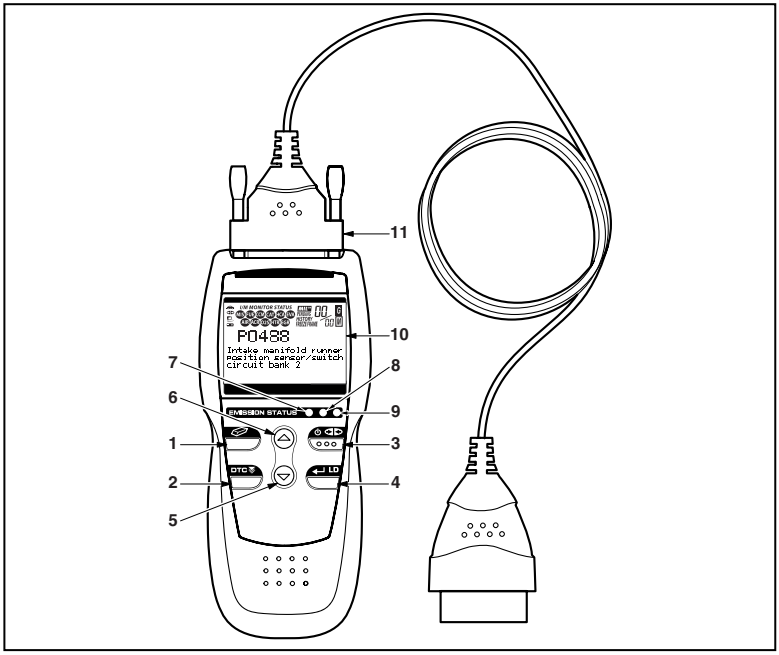


Figure 1. Controls and Indicators

See Figure 1 for the locations of items 1 through 11, below.

1. **ERASE button** - Erases Diagnostic Trouble Codes (DTCs), and "Freeze Frame" data from your vehicle's computer, and resets Monitor status.

2. **DTC SCROLL button** - Displays the DTC View screen and/or scrolls the display to view DTCs when more than one DTC is present.

3. **POWER/LINK button** - When the Scan Tool IS NOT connected to a vehicle, turns the Scan Tool "**On**" and "**Off**". When the Scan Tool is connected to a vehicle, links the Scan Tool to the vehicle's PCM to retrieve diagnostic data from the computer's memory.

   To turn the Scan Tool "On", you must press and hold the ***POWER/LINK*** *button for approximately 3 seconds.*

4. **ENTER/LIVE DATA button** - When in MENU mode, confirms the selected option or value. When linked to a vehicle, places the Scan Tool in "Live Data" mode.

5. ⊜ **DOWN button** - When in MENU mode, scrolls DOWN through the menu and submenu selection options. When LINKED to a vehicle, scrolls DOWN through the current display screen to display any additional data.
6. ⊜ **UP button** - When in MENU mode, scrolls UP through the menu and submenu selection options. When LINKED to a vehicle, scrolls UP through the current display screen to display any additional data.
7. **GREEN LED** - Indicates that all engine systems are running normally (all Monitors on the vehicle are active and performing their diagnostic testing, and no DTCs are present).
8. **YELLOW LED** - Indicates there is a possible problem. A "Pending" DTC is present and/or some of the vehicle's emission monitors have not run their diagnostic testing.
9. **RED LED** - Indicates there is a problem in one or more of the vehicle's systems. The red LED is also used to show that DTC(s) are present. DTCs are shown on the Scan Tool's display. In this case, the Multifunction Indicator ("Check Engine") lamp on the vehicle's instrument panel will light steady on.
10. **Display** - Displays settings Menu and submenus, test results, Scan Tool functions and Monitor status information. See **DISPLAY FUNCTIONS**, following, for more details.
11. **CABLE** - Connects the Scan Tool to the vehicle's Data Link Connector (DLC).

DISPLAY FUNCTIONS

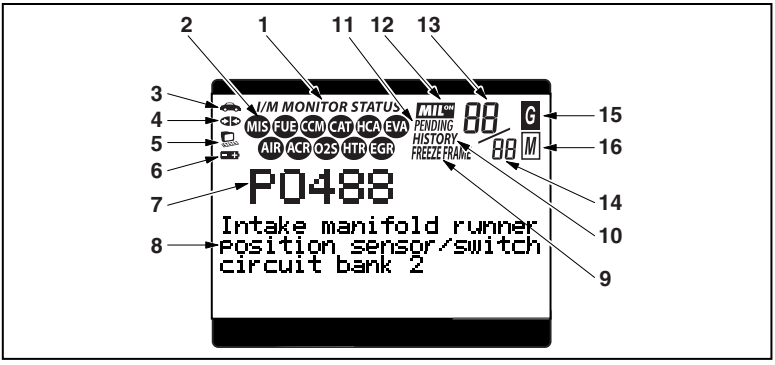


Figure 2. Display Functions

See Figure 2 for the locations of items 1 through 16, following.

1. **I/M MONITOR STATUS field** - Identifies the I/M Monitor status area.

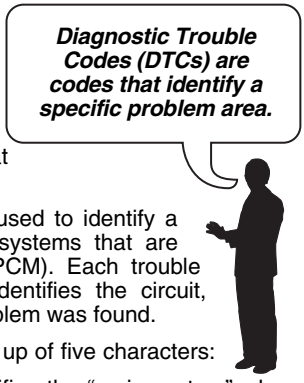
2. **Monitor icons** - Indicate which Monitors are supported by the vehicle under test, and whether or not the associated Monitor has run its diagnostic testing (Monitor status). When a Monitor icon is solid, it indicates that the associated Monitor has completed its diagnostic testing. When a Monitor icon is flashing, it indicates that the vehicle supports the associated Monitor, but the Monitor has not yet run its diagnostic testing.
3. **Vehicle icon** - Indicates whether or not the Scan Tool is being properly powered through the vehicle's Data Link Connector (DLC). A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
4. **Link icon** - Indicates whether or not the Scan Tool is communicating (linked) with the vehicle's on-board computer. When visible, the Scan Tool is communicating with the computer. If the Link icon is not visible, the Scan Tool is not communicating with the computer.
5. **Computer icon** - When this icon is visible it indicates that the Scan Tool is linked to a personal computer. An optional "PC Link Kit" is available that makes it possible to upload retrieved data to a personal computer.
6. **Scan Tool Internal Battery icon** - When visible, indicates the Scan Tool batteries are "low" and should be replaced. If the batteries are not replaced when the battery symbol is "on", all 3 LEDs will light up as a last resort indicator to warn you that the batteries need replacement. No data will be displayed on screen when all 3 LEDs are lit.
7. **DTC Display Area** - Displays the Diagnostic Trouble Code (DTC) number. Each fault is assigned a code number that is specific to that fault.
8. **Test Data Display Area** - Displays DTC definitions, Freeze Frame data, Live Data and other pertinent test information messages.
9. **FREEZE FRAME icon** - Indicates that there is Freeze Frame data from "Priority Code" (Code #1) stored in the vehicle's computer memory.
10. **HISTORY icon** - Indicates the currently displayed DTC is a "History" code.
11. **PENDING icon** - Indicates the currently displayed DTC is a "Pending" code.
12. **MIL icon** - Indicates the status of the Malfunction Indicator Lamp (MIL). The MIL icon is visible only when a DTC has commanded the MIL on the vehicle's dashboard to light.
13. **Code Number Sequence** - The Scan Tool assigns a sequence number to each DTC that is present in the computer's memory, starting with "01." This number indicates which code is currently displayed. Code number "01" is always the highest priority code, and the one for which "Freeze Frame" data has been stored.

If "01" is a "Pending" code, there may or may not be "Freeze Frame" data stored in memory.

14. **Code Enumerator** - Indicates the total number of codes retrieved from the vehicle's computer.
15. **G Generic DTC icon** - When visible, indicates that the currently displayed DTC is a "generic" or universal code.
16. **M Manufacturer Specific DTC icon** - When visible, indicates that the currently displayed DTC is a Manufacturer Specific Code.

DIAGNOSTIC TROUBLE CODES (DTCs)

Diagnostic Trouble Codes (DTCs) are meant to guide you to the proper service procedure in the vehicle's service manual. **DO NOT** replace parts based only on DTCs without first consulting the vehicle's service manual for proper testing procedures for that particular system, circuit or component.



DTCs are alphanumeric codes that are used to identify a problem that is present in any of the systems that are monitored by the on-board computer (PCM). Each trouble code has an assigned message that identifies the circuit, component or system area where the problem was found.

OBD2 diagnostic trouble codes are made up of five characters:

- The 1st character is a **letter**. It identifies the "main system" where the fault occurred (Body, Chassis, Powertrain, or Network).
- The 2nd character is a **numeric digit**. It identifies the "type" of code (Generic or Manufacturer-Specific).

Generic DTCs *are codes that are used by all vehicle manufacturers. The standards for generic DTCs, as well as their definitions, are set by the Society of Automotive Engineers (SAE).*

Manufacturer-Specific DTCs *are codes that are controlled by the vehicle manufacturers. The Federal Government does not require vehicle manufacturers to go beyond the standardized generic DTCs in order to comply with the new OBD2 emissions standards. However, manufacturers are free to expand beyond the standardized codes to make their systems easier to diagnose.*

- The 3rd character is a **numeric digit**. It identifies the specific system or sub-system where the problem is located.
- The 4th and 5th characters are **numeric digits**. They identify the section of the system that is malfunctioning.

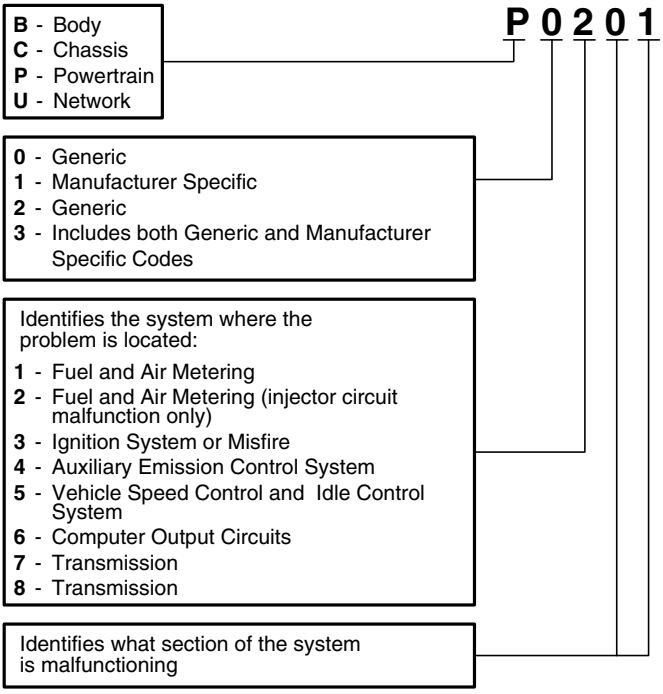
DTCs and MIL Status

When the vehicle's on-board computer detects a failure in an emissions-related component or system, the computer's internal diagnostic program assigns a diagnostic trouble code (DTC) that points to the system (and subsystem) where the fault was found. The diagnostic program saves the code in the computer's memory. It records a "Freeze Frame" of conditions present when the fault was found, and lights the Malfunction Indicator Lamp (MIL). Some faults require detection for two trips in a row before the MIL is turned on.

The "Malfunction Indicator Lamp" (MIL) is the accepted term used to describe the lamp on the dashboard that lights to warn the driver that an emissions-related fault has been found. Some manufacturers may still call this lamp a "Check Engine" or "Service Engine Soon" light.

OBD2 DTC EXAMPLE

P0201 - Injector Circuit Malfunction, Cylinder 1


P 0 2 0 1
B - Body
C - Chassis
P - Powertrain
U - Network
0 - Generic
1 - Manufacturer Specific
2 - Generic
3 - Includes both Generic and Manufacturer Specific Codes
Identifies the system where the problem is located:
1 - Fuel and Air Metering
2 - Fuel and Air Metering (injector circuit malfunction only)
3 - Ignition System or Misfire
4 - Auxiliary Emission Control System
5 - Vehicle Speed Control and Idle Control System
6 - Computer Output Circuits
7 - Transmission
8 - Transmission
Identifies what section of the system is malfunctioning

PRELIMINARY VEHICLE DIAGNOSTIC WORKSHEET

The purpose of this form is to help you gather preliminary information on your vehicle before you retrieve codes. By having a complete account of your vehicle's current problem(s), you will be able to systematically pinpoint the problem(s) by comparing your answers to the fault codes you retrieve. You can also provide this information to your mechanic to assist in diagnosis and help avoid costly and unnecessary repairs. It is important for you to complete this form to help you and/or your mechanic have a clear understanding of your vehicle's problems.

NAME:

DATE:

VIN*:

YEAR:

MAKE:

MODEL:

ENGINE SIZE:

VEHICLE MILEAGE:

*VIN: Vehicle Identification Number, found at the base of the windshield on a metallic plate, or at the driver door latch area (consult your vehicle owner's manual for location).

TRANSMISSION:

- ❑ Automatic
- ❑ Manual

Please check all applicable items in each category.

DESCRIBE THE PROBLEM:

WHEN DID YOU FIRST NOTICE THE PROBLEM:

- ❑ Just Started
- ❑ Started Last Week
- ❑ Started Last Month
- ❑ Other:

LIST ANY REPAIRS DONE IN THE PAST SIX MONTHS:

PROBLEMS STARTING

- ❑ No symptoms
- ❑ Will not crank
- ❑ Cranks, but will not start
- ❑ Starts, but takes a long time

ENGINE QUITS OR STALLS

- ❑ No symptoms
- ❑ Right after starting
- ❑ When shifting into gear
- ❑ During steady-speed driving
- ❑ Right after vehicle comes to a stop
- ❑ While idling
- ❑ During acceleration
- ❑ When parking

IDLING CONDITIONS

- ❑ No symptoms
- ❑ Is too slow at all times
- ❑ Is too fast
- ❑ Is sometimes too fast or too slow
- ❑ Is rough or uneven
- ❑ Fluctuates up and down

RUNNING CONDITIONS

- ❑ No symptoms
- ❑ Runs rough
- ❑ Lacks power
- ❑ Bucks and jerks
- ❑ Poor fuel economy
- ❑ Hesitates or stumbles on accelerations
- ❑ Backfires
- ❑ Misfires or cuts out
- ❑ Engine knocks, pings or rattles
- ❑ Surges
- ❑ Dieseling or run-on

AUTOMATIC TRANSMISSION PROBLEMS (if applicable)

- ❑ No symptoms
- ❑ Shifts too early or too late
- ❑ Changes gear incorrectly
- ❑ Vehicle does not move when in gear
- ❑ Jerks or bucks

PROBLEM OCCURS

- ❑ Morning
- ❑ Afternoon
- ❑ Anytime

ENGINE TEMPERATURE WHEN PROBLEM OCCURS

- ❑ Cold
- ❑ Warm
- ❑ Hot

DRIVING CONDITIONS WHEN PROBLEM OCCURS

- ❑ Short - less than 2 miles
- ❑ 2 - 10 miles
- ❑ Long - more than 10 miles
- ❑ Stop and go
- ❑ While turning
- ❑ While braking
- ❑ At gear engagement
- ❑ With A/C operating
- ❑ With headlights on
- ❑ During acceleration
- ❑ Mostly driving downhill
- ❑ Mostly driving uphill
- ❑ Mostly driving level
- ❑ Mostly driving curvy roads
- ❑ Mostly driving rough roads

DRIVING HABITS

- ❑ Mostly city driving
- ❑ Highway
- ❑ Park vehicle inside
- ❑ Park vehicle outside
- ❑ Drive less than 10 miles per day
- ❑ Drive 10 to 50 miles per day
- ❑ Drive more than 50 miles per day

GASOLINE USED

- ❑ 87 Octane
- ❑ 89 Octane
- ❑ 91 Octane
- ❑ More than 91 Octane

WEATHER CONDITIONS WHEN PROBLEM OCCURS

- ❑ 32 - 55° F (0 - 13° C)
- ❑ Above 55° F (13° C)
- ❑ Below freezing (32° F / 0° C)

CHECK ENGINE LIGHT / DASH WARNING LIGHT

- ❑ Sometimes ON
- ❑ Always ON
- ❑ Never ON

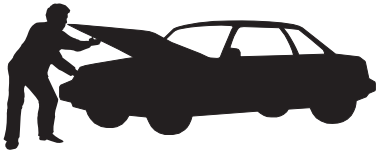
PECULIAR SMELLS

- ❑ "Hot"
- ❑ Sulfur ("rotten egg")
- ❑ Burning rubber
- ❑ Gasoline
- ❑ Burning oil
- ❑ Electrical

STRANGE NOISES

- ❑ Rattle
- ❑ Knock
- ❑ Squeak
- ❑ Other

BEFORE YOU BEGIN



The Enhanced OBD2 Scan Tool aids in monitoring electronic- and emissions-related faults in your vehicle and retrieving fault codes related to malfunctions in these systems. Mechanical problems such as low oil level or damaged hoses, wiring or electrical connectors can cause poor engine performance and may also cause a fault code to set. Fix any known mechanical problems before performing any test. See your vehicle's service manual or a mechanic for more information.

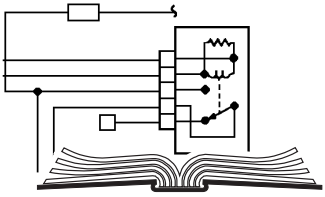
Check the following areas **before** starting any test:

- Check the engine oil, power steering fluid, transmission fluid (if applicable), engine coolant and other fluids for proper levels. Top off low fluid levels if needed.
- Make sure the air filter is clean and in good condition. Make sure all air filter ducts are properly connected. Check the air filter ducts for holes, rips or cracks.
- Make sure all engine belts are in good condition. Check for cracked, torn, brittle, loose or missing belts.
- Make sure mechanical linkages to engine sensors (throttle, gearshift position, transmission, etc.) are secure and properly connected. See your vehicle's service manual for locations.
- Check all rubber hoses (radiator) and steel hoses (vacuum/fuel) for leaks, cracks, blockage or other damage. Make sure all hoses are routed and connected properly.
- Make sure all spark plugs are clean and in good condition. Check for damaged, loose, disconnected or missing spark plug wires.
- Make sure the battery terminals are clean and tight. Check for corrosion or broken connections. Check for proper battery and charging system voltages.
- Check all electrical wiring and harnesses for proper connection. Make sure wire insulation is in good condition, and there are no bare wires.
- Make sure the engine is mechanically sound. If needed, perform a compression check, engine vacuum check, timing check (if applicable), etc.

VEHICLE SERVICE MANUALS

Always refer to the manufacturer's service manual for your vehicle before performing any test or repair procedures. Contact your local car dealership, auto parts store or bookstore for availability of these manuals. The following companies publish valuable repair manuals:

- **Haynes Publications**
  861 Lawrence Drive
  Newbury Park, California 91320
  Phone: 800-442-9637
- **Mitchell International**
  14145 Danielson Street
  Poway, California 92064
  Phone: 888-724-6742
- **Motor Publications**
  5600 Crooks Road, Suite 200
  Troy, Michigan 48098
  Phone: 800-426-6867



FACTORY SOURCES

Ford, GM, Chrysler, Honda, Isuzu, Hyundai and Subaru Service Manuals

- **Helm Inc.**
  14310 Hamilton Avenue
  Highland Park, Michigan 48203
  Phone: 800-782-4356

CODE RETRIEVAL PROCEDURE

Retrieving and using Diagnostic Trouble Codes (DTCs) for troubleshooting vehicle operation is only one part of an overall diagnostic strategy.

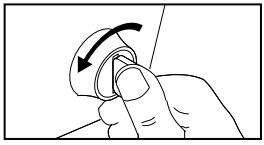
Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information is found in the vehicle's service manual. Always refer to the vehicle's service manual for detailed testing instructions.

Check your vehicle thoroughly before performing any test. See BEFORE YOU BEGIN on page 20 for details.

***ALWAYS** observe safety precautions whenever working on a vehicle. See SAFETY PRECAUTIONS on page 3 for more information.*

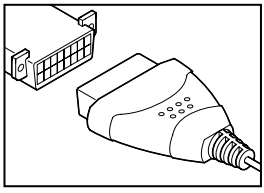
1. Turn the ignition off.

2. Locate the vehicle's 16-pin Data Link Connector (DLC). See page 5 for connector location.



Some DLCs have a plastic cover that must be removed before connecting the Scan Tool cable connector.

*If the Scan Tool is ON, turn it OFF by pressing the **POWER/LINK** button BEFORE connecting the Scan Tool to the DLC.*



3. Connect the Scan Tool cable connector to the vehicle's DLC. The cable connector is keyed and will only fit one way.

- If you have problems connecting the cable connector to the DLC, rotate the connector 180° and try again.
- If you still have problems, check the DLC on the vehicle and on the Scan Tool. Refer to your vehicle's service manual to properly check the vehicle's DLC.

4. When the Scan Tool's cable connector is properly connected to the vehicle's DLC, the unit automatically turns ON, and the display shows instructions for linking to the vehicle's on-board computer.

- If the unit does not power on automatically when connected to the vehicle's DLC connector, it usually indicates there is no power present at the vehicle's DLC connector. Check your fuse panel and replace any burned-out fuses.
- If replacing the fuse(s) does not correct the problem, consult your vehicle's repair manual to identify the proper computer (PCM) fuse/circuit, and perform any necessary repairs before proceeding.

5. Turn the ignition on. **DO NOT** start the engine.

6. Press and release the Scan Tool's **POWER/LINK** button.

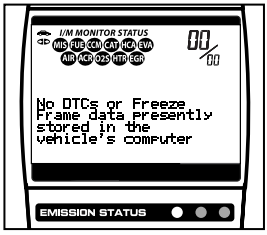
- The Scan Tool will automatically start a check of the vehicle's computer to determine which type of communication protocol it is using. When the Scan Tool identifies the computer's communication protocol, a communication link is established. The protocol type used by the vehicle's computer is shown on the display.

A PROTOCOL is a set of rules and procedures for regulating data transmission between computers, and between testing equipment and computers. As of this writing, five different types of protocols (ISO 9141, Keyword 2000, J1850 PWM, J1850 VPW and CAN) are in use by vehicle manufacturers. The Scan Tool automatically identifies the protocol type and establishes a communication link with the vehicle's computer.

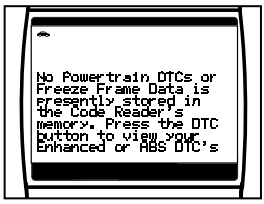
7. After approximately 10~60 seconds, the Scan Tool will **retrieve** and **display** any Diagnostic Trouble Codes, Monitor Status and Freeze Frame Data retrieved from the vehicle's computer memory.

- If the Scan Tool fails to link to the vehicle's computer a "Linking Failed" message shows on the Scan Tool's display.
  - Verify the connection at the DLC, and verify the ignition is ON.
  - Turn the ignition OFF, wait 5 seconds, then turn back ON to reset the computer.
  - Ensure your vehicle is OBD2 compliant. See VEHICLES COVERED on page 5 for vehicle compliance verification information.

- The Scan Tool will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No DTC's or Freeze Frame data presently stored in the vehicle's computer" message is displayed.


I/M MONITOR STATUS
MIL FUL CCM CAT HCA EVA
AIR HCM O2S HTR EGR
00
00
No DTCs or Freeze Frame data presently stored in the vehicle's computer
EMISSION STATUS

  - If the **ENTER/LD** button is pressed from the "no DTCs" screen, the message "No Powertrain DTCs or Freeze Frame Data is presently stored in the Scan Tool's memory. Press the DTC button to view your Enhanced or ABS DTC's" displays. Press the **DTC SCROLL** button to enter the "enhanced" mode (see THE ENHANCED MAIN MENU on page 28).

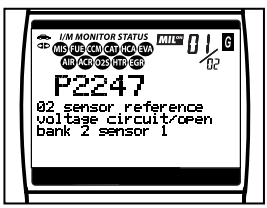

No Powertrain DTCs or Freeze Frame Data is presently stored in the Code Reader's memory. Press the DTC button to view your Enhanced or ABS DTC's

- The Scan Tool is capable of retrieving and storing up to 32 codes in memory, for immediate or later viewing.

8. To read the display:

Refer to DISPLAY FUNCTIONS on page 12 for a description of display elements.

- A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- A visible icon indicates that the Scan Tool is linked to (communicating with) the vehicle's computer.
- The I/M Monitor Status icons indicate the type and number of Monitors the vehicle supports, and provides indications of the current status of the vehicle's Monitors. A **solid** Monitor icon indicates the associated Monitor **has run** and completed its testing. A **blinking** Monitor icon indicates the associated Monitor **has not** run and completed its testing.
- The upper right hand corner of the display shows the number of the code currently being displayed, the total number of codes retrieved, the type of code (**G** = Generic; **M** = Enhanced or Manufacturer specific), and whether or not the displayed code commanded the MIL on. If the code being displayed is a PENDING code, the PENDING icon is shown.



- The Diagnostic Trouble Code (DTC) and related code definition are shown in the lower section of the display.

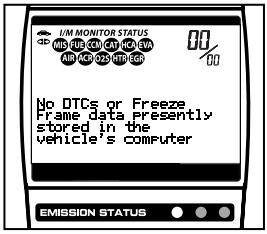
In the case of long code definitions, or when viewing Freeze Frame and Live Data, a small arrow is shown in the upper/lower right-hand corner of the Scan Tool display area to indicate the presence of additional information. Use the ⏶ and ⏷ buttons, as necessary, to view the additional information.

If a definition for the currently displayed code is not available, an advisory message shows on the Scan Tool's display.

9. Read and interpret Diagnostic Trouble Codes/system condition using the display and the green, yellow and red LEDs.

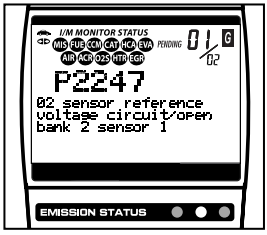
The green, yellow and red LEDs are used (with the display) as visual aids to make it easier to determine engine system conditions.

- **Green LED** – Indicates that all engine systems are "OK" and operating normally. All monitors supported by the vehicle have run and performed their diagnostic testing, and no trouble codes are present. A zero will show on the Scan Tool's display, and all Monitor icons will be solid.

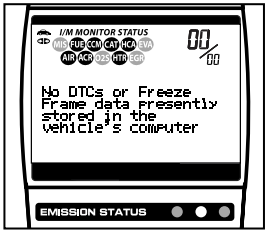

I/M MONITOR STATUS
MIS FUE CCM CAT HCA EVA
AIR ACR O2S HTR EGR
00
00
No DTCs or Freeze Frame data presently stored in the vehicle's computer
EMISSION STATUS

- **Yellow LED** – Indicates one of the following conditions:

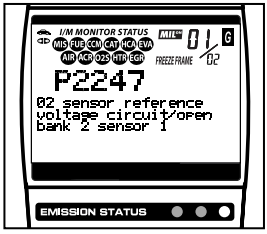
A. A PENDING CODE IS PRESENT – If the yellow LED is illuminated, it may indicate a Pending code is present. Check the Scan Tool's display for confirmation. A Pending code is confirmed by the presence of a numeric code and the word PENDING on the Scan Tool's display.



B. MONITOR NOT RUN STATUS – If the Scan Tool's display shows a zero (indicating there are no DTC's present in the vehicle's computer memory), but the yellow LED is illuminated, it may be an indication that some of the Monitors supported by the vehicle have not yet run and completed their diagnostic testing. Check the Scan Tool's display for confirmation. All Monitor icons that are **blinking** have not yet run and completed their diagnostic testing; all Monitor icons that are **solid** have run and completed their diagnostic testing.


I/M MONITOR STATUS
MIS FUE CCM CAT HCA EVA
AIR ACR O2S HTR EGR
00
00
No DTCs or Freeze Frame data presently stored in the vehicle's computer
EMISSION STATUS

- **Red LED** – Indicates there is a problem with one or more of the vehicle's systems. The red LED is also used to indicate that DTC(s) are present (displayed on the Scan Tool's screen). In this case, the Multifunction Indicator (Check Engine) lamp on the vehicle's instrument panel will be illuminated.


I/M MONITOR STATUS
MIS FUL CCM CAT HCA EVA
AIR ACR O2S HTR EGR
FREEZE FRAME
P2247
02 sensor reference voltage circuit/open bank 2 sensor 1
EMISSION STATUS

- DTC's that start with "P0", "P2" and some "P3" are considered Generic (Universal). All Generic DTC definitions are the same on all OBD2 equipped vehicles. The Scan Tool automatically displays the code definitions (if available) for Generic DTC's.

If the definition for the currently displayed code is not available, an advisory message shows on the Scan Tool's LCD display.

- DTC's that start with "P1" and some "P3" are Manufacturer specific codes and their code definitions vary with each vehicle manufacturer. When a Manufacturer specific DTC is retrieved, the LCD display shows a list of vehicle manufacturers. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight the appropriate manufacturer, then press the **ENTER/LD** button to display the correct code definition for your vehicle.

*If the manufacturer for your vehicle is not listed, use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to select **Other manufacturer** and press the **ENTER/LD** button for additional DTC information.*

If the Manufacturer Specific definition for the currently displayed code is not available, an advisory message shows on the Scan Tool's display.

I/M MONITOR STATUS
MIS FUL CCM CAT HCA EVA
AIR ACR O2S HTR EGR
P1274 FORD
The Manufacturer Specific Definition is not available
Visit: www.CanOBD2.com for definition

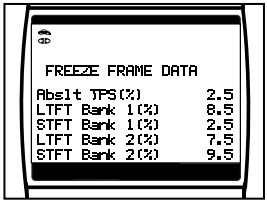
10. If more than one DTC was retrieved, and to view Freeze Frame Data, press and release the **DTC SCROLL** button, as necessary.

- Each time the **DTC SCROLL** button is pressed and released, the Scan Tool will scroll and display the next DTC in sequence until all DTCs in its memory have displayed.

- Freeze Frame Data (if available) will display after DTC #1.

Whenever the Scroll function is used to view additional DTCs and Freeze Frame Data, the Scan Tool's communication link with the vehicle's computer disconnects. To re-establish communication, press the ***POWER/LINK*** *button again.*

- In OBD2 systems, when an emissions-related engine malfunction occurs that causes a DTC to set, a record or snapshot of engine conditions at the time that the malfunction occurred is also saved in the vehicle's computer memory. The record saved is called Freeze Frame data. Saved engine conditions include, but are not limited to: engine speed, open or closed loop operation, fuel system commands, coolant temperature, calculated load value, fuel pressure, vehicle speed, air flow rate, and intake manifold pressure.



*If more than one malfunction is present that causes more than one DTC to be set, only the code with the highest priority will contain Freeze Frame data. The code designated "**01**" on the Scan Tool display is referred to as the PRIORITY code, and Freeze Frame data always refers to this code. The priority code is also the one that has commanded the MIL on.*

Retrieved information can be uploaded to a Personal Computer (PC) with the use of an optional "PC Link Kit." (see instructions included with PC-Link program for more information).

11. When the last retrieved DTC has been displayed and the **DTC SCROLL** button is pressed, the Scan Tool enters the "enhanced" mode.

- See VIEWING ENHANCED DTCs on page 32 to view enhanced DTCs for your vehicle.
- If you do not wish to view enhanced DTCs, press the **DTC SCROLL** button to return to the OBD2 DTC screen.

If a Manufacturer specific DTC was retrieved during the code retrieval process, and the manufacturer selected for the code ***was not*** *Chrysler, Jeep, Ford, Mazda, General Motors or Isuzu, pressing the* ***DTC SCROLL*** *button after display of the* ***last*** *retrieved DTC returns the screen to the* ***first*** *retrieved DTC (the Enhanced DTC menu* ***is not*** *displayed).*

12. Determine engine system(s) condition by viewing the Scan Tool's display for any retrieved Diagnostic Trouble Codes, code definitions, Freeze Frame data and Live Data, interpreting the green, yellow and red LEDs.

- If DTC's were retrieved and you are going to perform the repairs yourself, proceed by consulting the Vehicle's Service Repair Manual for testing instructions, testing procedures, and flow charts related to retrieved code(s).
- If you plan to take the vehicle to a professional to have it serviced, complete the PRELIMINARY VEHICLE DIAGNOSTIC WORKSHEET on page 17 and take it together with the retrieved codes, freeze frame data and LED information to aid in the troubleshooting procedure.
- To prolong battery life, the Scan Tool automatically shuts "Off" approximately three minutes after it is disconnected from the vehicle. The DTCs retrieved, captured Live Data Information, Monitor Status and Freeze Frame data (if any) will remain in the Scan Tool's memory, and may be viewed at any time by turning the unit "On". If the Scan Tool's batteries are removed, or if the Scan Tool is re-linked to a vehicle to retrieve codes/data, any prior codes/data in its memory are automatically cleared.

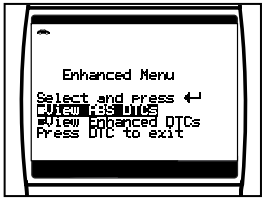
THE ENHANCED MAIN MENU

Following the code retrieval procedure (see CODE RETRIEVAL PROCEDURE on page 22), when the last retrieved DTC has been displayed and the **DTC SCROLL** button is pressed, the Scan Tool enters the "enhanced" mode. The "enhanced" mode provides the ability to retrieve *enhanced* DTCs from most Chrysler/Jeep, Ford/Mazda, GM/Isuzu, Honda/Acura and Toyota/Lexus vehicles. The types of enhanced data available depends on the vehicle make. You can also retrieve Anti-Lock Brake System (ABS) DTCs.

ABS DTCs are available for Chrysler/Jeep, Ford and GM vehicles only.

The screen shown when the Scan Tool enters the "enhanced" mode depends on the type(s) of DTC(s) returned during the code retrieval process:

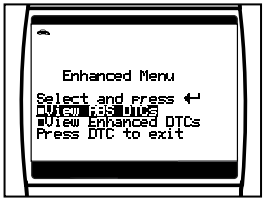
- If *no* DTCs were retrieved, or *only* generic DTCs were retrieved, the Enhanced Main Menu displays. Use the **UP** and **DOWN** buttons, as necessary, to highlight the desired option, then press the **ENTER/LD** button to view the selected information, or, press the **DTC SCROLL** button to return to the OBD2 DTC screen.



  - When **View ABS DTCs** or **View Enhanced DTCs** is selected, the Select Manufacturer screen displays. Use the **UP** and **DOWN** buttons, as necessary, to highlight the appropriate manufacturer, then press the **ENTER/LD** button to view the selected information.

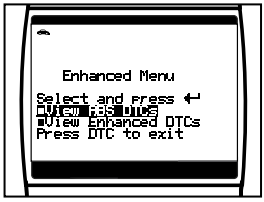
*If the manufacturer of the vehicle from which codes were retrieved is not listed, press the **DTC SCROLL** button to return to the OBD2 DTC screen. Enhanced data is not available for your vehicle.*

- If a Manufacturer specific DTC was retrieved, and the manufacturer selected for the code *was* Chrysler, Jeep, Ford, Mazda, General Motors, Isuzu, Honda, Acura, Toyota or Lexus, the Select Data menu displays. Use the **UP** and **DOWN** buttons, as necessary, to highlight the desired option, then press the **ENTER/LD** button to view the selected information, or, press the **DTC SCROLL** button to return to the OBD2 DTC screen.

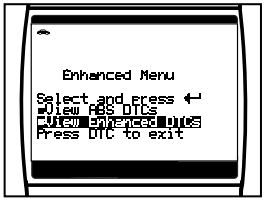


- If a Manufacturer specific DTC was retrieved, and the manufacturer selected for the code *was not* Chrysler, Jeep, Ford, Mazda, General Motors, Isuzu, Honda, Acura, Toyota or Lexus the "enhanced" mode is bypassed, and the OBD2 DTC screen shows the *first* code retrieved. Enhanced data is not available for your vehicle.

To view ABS DTCs: Select **View ABS DTCs** from the Enhanced Main Menu (then choose the appropriate manufacturer if prompted). Refer to VIEWING ABS DTCs on page 29 to view ABS DTCs for your vehicle.

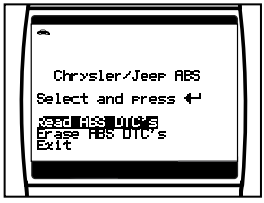


To view Enhanced DTCs: Select **View Enhanced DTCs** from the Enhanced Main Menu (then choose the appropriate manufacturer if prompted). Refer to VIEWING ENHANCED DTCs on page 32 to view enhanced DTCs for your vehicle.



VIEWING ABS DTCs

When **View ABS DTCs** is selected from the Enhanced Main Menu (and the appropriate vehicle manufacturer is selected, if prompted), the ABS Menu for the appropriate vehicle manufacturer displays. You may choose to "Read ABS DTCs" or "Erase ABS DTCs."



Reading ABS DTCs

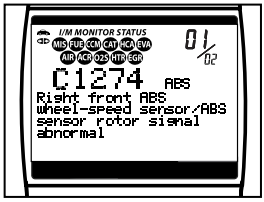
1. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight Read ABS DTCs, then press the **ENTER/LD** button.

   - A "One moment please" message displays while the Scan Tool retrieves the selected DTCs.
   - If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's display.
     - Verify the ignition is ON, then press the **ENTER/LD** button to continue.
   - If the vehicle does not support ABS communication, an advisory message shows on the Scan Tool's display. Press the **ENTER/LD** button to return to exit.

2. To read the display:

Refer to DISPLAY FUNCTIONS on page 12 for a description of LCD display elements.

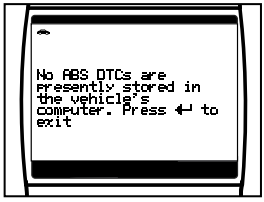
   - A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
   - A visible icon indicates that the Scan Tool is linked to (communicating with) the vehicle's computer.
   - The upper right hand corner of the display shows the number of the code currently being displayed, the total number of codes retrieved.
   - The Diagnostic Trouble Code (DTC) and related code definition are shown in the lower section of the LCD display.


I/M MONITOR STATUS
MIS FUL CCM CAT HCA EVA
AIR ACR O2S HTR EGR
01/02
C1274 ABS
Right front ABS wheel-speed sensor/ABS sensor rotor signal abnormal

I/M MONITOR STATUS icons are not displayed when viewing ABS DTCs.

*In the case of long code definitions, a small arrow is shown in the upper/lower right-hand corner of the code display area to indicate the presence of additional information. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to view the additional information.*

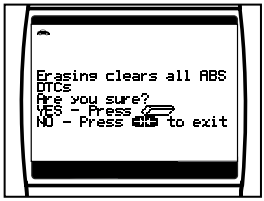
   - The Scan Tool will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No ABS DTC's are presently stored in the vehicle's computer" is displayed. Press the **ENTER/LD** button to return to the ABS Menu.



3. If more than one code was retrieved press the **DTC SCROLL** button, as necessary, to display additional codes one at a time.
   - Whenever the scroll function is used to view additional codes, the Scan Tool's communication link with the vehicle's computer disconnects. To re-establish communication, press the **LINK** button again.
4. When the last retrieved DTC has been displayed and the **DTC SCROLL** button is pressed, the Scan Tool returns to the ABS Menu.
   - To exit the enhanced mode, use the **UP** and **DOWN** buttons, as necessary, to select Exit from the ABS Menu, then press the **ENTER/LD** button. The Code Reader returns to the OBD2 DTC screen.

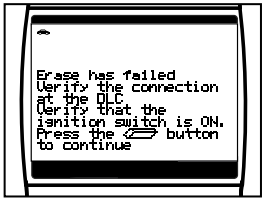
Erasing ABS DTCs

If you plan to take the vehicle to a Service Center for repair, DO NOT erase the ABS DTCs from the vehicle's computer. If the codes are erased, valuable information that might help the technician troubleshoot the problem will be erased.



1. Use the **UP** and **DOWN** buttons, as necessary, to highlight Erase ABS DTCs, then press the **ENTER/LD** button.
2. A confirmation message shows on the LCD display.
   - If you are sure you want to proceed, press the **ERASE** button to erase the ABS DTCs from the vehicle's computer.
   - If you do not want to continue with the erase process, press the **POWER/LINK** button to exit the erase mode and return to the ABS Menu.
3. If you chose to erase ABS DTCs, a progress screen displays while ion is in progress.
   - If the erase was successful, a confirmation message shows on the LCD display. Press the **ENTER/LD** button to return to the ABS Menu.

   - If the erase was not successful, an advisory message shows on the LCD display. Verify that the Scan Tool is properly connected to the vehicle's DLC and that the ignition is on, then repeat steps 2 and 3, above.



Erasing ABS DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem(s) that caused the code(s) to be set are not made, the code(s) will appear again as soon as the vehicle is driven long enough for the problem to recur.

VIEWING ENHANCED DTCs

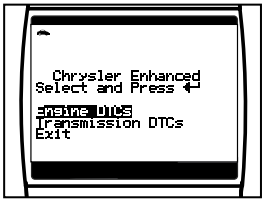
Refer to the appropriate paragraph to view enhanced data for your vehicle:

- Chrysler/Jeep ..... page 32
- Ford/Mazda ..... page 33
- GM/Isuzu ..... page 35
- Honda/Acura ..... page 37
- Toyota/Lexus ..... page 38

Chrysler/Jeep Enhanced DTCs

When **View Enhanced DTCs** is selected from the Enhanced Main Menu (and **Chrysler/Jeep** is selected, if prompted), the Chrysler Enhanced menu displays. You may view either "Engine DTCs" or "Transmission DTCs."

1. Use the **UP** and **DOWN** buttons, as necessary, to highlight the desired option, then press the **ENTER/LD** button.



*Transmission DTCs **are not** supported on most Chrysler/Jeep vehicles manufactured prior to 2002.*

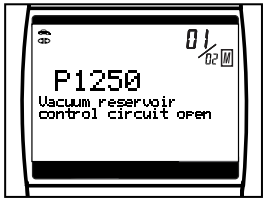
- A "One moment please" message displays while the Scan Tool retrieves the selected DTCs.
- If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's display.
  - Verify the ignition is ON, then press the **ENTER/LD** button to continue.

2. To read the display:

Refer to DISPLAY FUNCTIONS on page 12 for a description of LCD display elements.

- A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- A visible icon indicates that the Scan Tool is linked to (communicating with) the vehicle's computer.

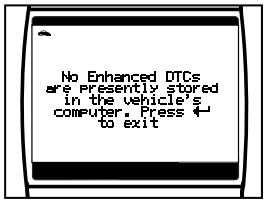
- The upper right hand corner of the display shows the number of the code currently being displayed, the total number of codes retrieved.
- The Diagnostic Trouble Code (DTC) and related code definition are shown in the lower section of the LCD display.



I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

In the case of long code definitions, or when viewing Freeze Frame data, a small arrow is shown in the upper/lower right-hand corner of the code display area to indicate the presence of additional information. Use the ⏶ and ⏷ buttons, as necessary, to view the additional information.

- The Scan Tool will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **ENTER/LD** button to return to the Chrysler Enhanced menu.

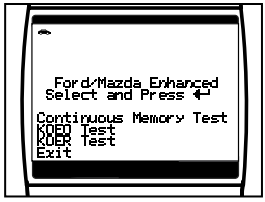


3. If more than one code was retrieved press the **DTC SCROLL** button, as necessary, to display additional codes one at a time.
   - Whenever the Scroll function is used to view additional codes, the Scan Tool's communication link with the vehicle's computer disconnects. To re-establish communication, press the **LINK** button again.
4. When the last retrieved DTC has been displayed and the **DTC SCROLL** button is pressed, the Scan Tool returns to the Chrysler Enhanced menu.
   - To view *additional* enhanced DTCs, repeat steps **1** through **4**, above.
   - To exit the enhanced mode, use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to select **Exit** from the Chrysler Enhanced menu, then press the **ENTER/LD** button. The Scan Tool returns to the OBD2 DTC screen.

Ford/Mazda Enhanced DTCs

*Mazda Enhanced DTCs are available for **Mazda-branded Ford vehicles only**.*

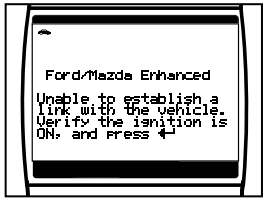
When **View Enhanced DTCs** is selected from the Enhanced Main Menu (and **Ford/Mazda** is selected, if prompted), the Ford/Mazda Enhanced menu displays. You may view DTCs for either the "Continuous Memory Test", "KOEO (Key On Engine Off) Test" or "KOER (Key On Engine Running) Test."



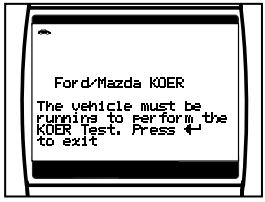
1. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight the desired option, then press the **ENTER/LD** button.

*When choosing to view **KOER Test** DTCs, start the vehicle's engine before making your selection.*

- A "One moment please" message displays, while the Scan Tool retrieves the selected DTCs.
- If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.



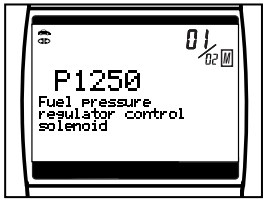
  - Verify the ignition is ON, then press the **ENTER/LD** button to continue.
- If the KOER Test was selected, and the vehicle's engine *is not* running, an advisory message shows on the Scan Tool's display.
  - Start the vehicle's engine, then press the **ENTER/LD** button to continue.



2. To read the display:

Refer to DISPLAY FUNCTIONS on page 12 for a description of LCD display elements.

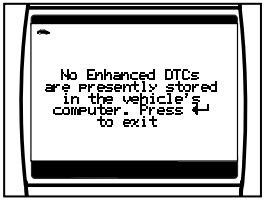
- A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- A visible icon indicates that the Scan Tool is linked to (communicating with) the vehicle's computer.
- The upper right hand corner of the display shows the number of the code currently being displayed, the total number of codes retrieved.
- The Diagnostic Trouble Code (DTC) and related code definition are shown in the lower section of the LCD display.



I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

In the case of long code definitions, or when viewing Freeze Frame data, a small arrow is shown in the upper/lower right-hand corner of the code display area to indicate the presence of additional information. Use the ⏶ and ⏷ buttons, as necessary, to view the additional information.

- The Scan Tool will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **ENTER/LD** button to return to the Ford/Mazda Enhanced menu.



3. If more than one code was retrieved press the **DTC SCROLL** button, as necessary, to display additional codes one at a time.
   - Whenever the Scroll function is used to view additional codes, the Scan Tool's communication link with the vehicle's computer disconnects. To re-establish communication, press the **LINK** button again.
4. When the last retrieved DTC has been displayed and the **DTC SCROLL** button is pressed, the Scan Tool returns to the Ford/Mazda Enhanced menu.
   - To view *additional* enhanced DTCs, repeat steps **1** through **4**, above.
   - To exit the enhanced mode, use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to select **Exit** from the Ford/Mazda Enhanced menu, then press the **ENTER/LD** button. The Scan Tool returns to the OBD2 DTC screen.

General Motors/Isuzu Enhanced DTCs

When **View Enhanced DTCs** is selected from the Enhanced Main Menu (and **General Motors/Isuzu** is selected, if prompted), the GM/Isuzu Enhanced menu displays. You may view the "MIL DTC", "Current DTC", "Fail Since Clear DTC" or "History DTC."

1. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight the desired option, then press the **ENTER/LD** button.
   - A "One moment please" message displays while the Scan Tool retrieves the selected DTCs.

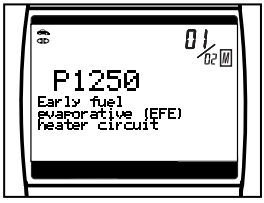
- If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's display.

  - Verify the ignition is ON, then press the **ENTER/LD** button to continue.

2. To read the display:

Refer to DISPLAY FUNCTIONS on page 12 for a description of LCD display elements.

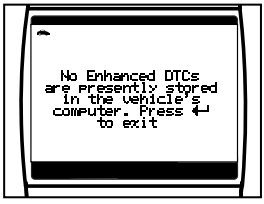
- A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- A visible icon indicates that the Scan Tool is linked to (communicating with) the vehicle's computer.
- The upper right hand corner of the display shows the number of the code currently being displayed, the total number of codes retrieved.
- The Diagnostic Trouble Code (DTC) and related code definition are shown in the lower section of the LCD display.



I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

In the case of long code definitions, or when viewing Freeze Frame data, a small arrow is shown in the upper/lower right-hand corner of the code display area to indicate the presence of additional information. Use the and buttons, as necessary, to view the additional information.

- The Scan Tool will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **ENTER/LD** button to return to the GM Enhanced menu.

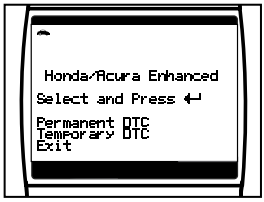


3. If more than one code was retrieved press the **DTC SCROLL** button, as necessary, to display additional codes one at a time.

- Whenever the Scroll function is used to view additional codes, the Scan Tool's communication link with the vehicle's computer disconnects. To re-establish communication, press the **LINK** button again.

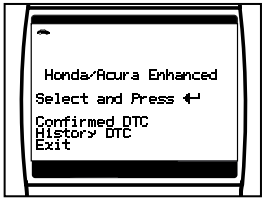
4. When the last retrieved DTC has been displayed and the **DTC SCROLL** button is pressed, the Scan Tool returns to the GM/Isuzu Enhanced menu.
   - To view *additional* enhanced DTCs, repeat steps **1** through **4**, above.
   - To exit the enhanced mode, use the **UP** and **DOWN** buttons, as necessary, to select **Exit** from the GM/Isuzu Enhanced menu, then press the **ENTER/LD** button. The Scan Tool returns to the OBD2 DTC screen.

Honda/Acura Enhanced DTCs

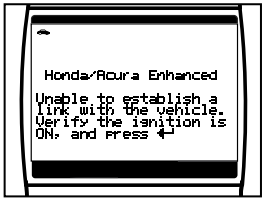


When **View Enhanced DTCs** is selected from the Enhanced Main Menu (and **Honda/Acura** is selected, if prompted), the Honda Acura Enhanced menu displays. Depending on the protocol used to communicate with your vehicle, the Honda/Acura Enhanced menu provides options to view:

- Permanent DTCs or Temporary DTCs
- Confirmed DTCs or History DTCs



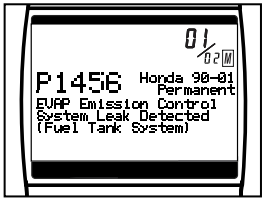
1. Use the **UP** and **DOWN** buttons, as necessary, to highlight the desired option, then press the **ENTER/LD** button.
   - A "One moment please" message displays while the Scan Tool retrieves the selected DTCs.
   - If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's display.
     - Verify the ignition is ON, then press the **ENTER/LD** button to continue.



2. To read the display:

Refer to DISPLAY FUNCTIONS on page 12 for a description of LCD display elements.

   - A visible icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
   - A visible icon indicates that the Scan Tool is linked to (communicating with) the vehicle's computer.
   - The upper right hand corner of the display shows the number of the code currently being displayed, the total number of codes retrieved.

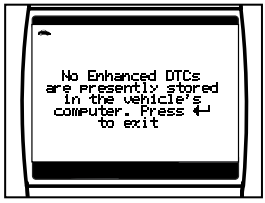


- The Diagnostic Trouble Code (DTC) and related code definition are shown in the lower section of the LCD display.

I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

In the case of long code definitions, or when viewing Freeze Frame data, a small arrow is shown in the upper/lower right-hand corner of the code display area to indicate the presence of additional information. Use the ⏶ and ⏷ buttons, as necessary, to view the additional information.

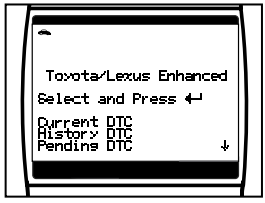
- The Scan Tool will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **ENTER/LD** button to return to the Honda/Acura Enhanced menu.



3. If more than one code was retrieved press the **DTC SCROLL** button, as necessary, to display additional codes one at a time.
   - Whenever the Scroll function is used to view additional codes, the Scan Tool's communication link with the vehicle's computer disconnects. To re-establish communication, press the **LINK** button again.
4. When the last retrieved DTC has been displayed and the **DTC SCROLL** button is pressed, the Scan Tool returns to the Honda/Acura Enhanced menu.
   - To view *additional* enhanced DTCs, repeat steps **1** through **4**, above.
   - To exit the enhanced mode, use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to select **Exit** from the Honda/Acura Enhanced menu, then press the **ENTER/LD** button. The Scan Tool returns to the OBD2 DTC screen.

Toyota/Lexus Enhanced DTCs

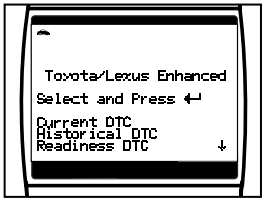
When **View Enhanced DTCs** is selected from the Enhanced Main Menu (and **Toyota/Lexus** is selected, if prompted), the Toyota/Lexus Enhanced menu displays. Depending on the protocol used to communicate with your vehicle, the Toyota/Lexus Enhanced menu provides options to view:



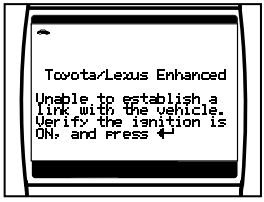
- Current DTCs, History DTCs or Pending DTCs

- Current DTCs, Historical DTCs or Readiness DTCs

1. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight the desired option, then press the **ENTER/LD** button.



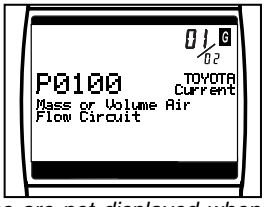
- A "One moment please" message displays, while the Scan Tool retrieves the selected DTCs.
- If the Scan Tool fails to link to the vehicle's computer, a "Linking Failed" message shows on the Scan Tool's Display.
  - Verify the ignition is ON, then press the **ENTER/LD** button to continue.



2. To read the display:

Refer to DISPLAY FUNCTIONS on page 12 for a description of LCD display elements.

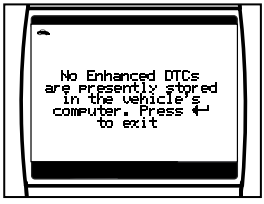
- A visible 🚗 icon indicates that the Scan Tool is being powered through the vehicle's DLC connector.
- A visible ⧏⧐ icon indicates that the Scan Tool is linked to (communicating with) the vehicle's computer.
- The upper right hand corner of the display shows the number of the code currently being displayed, the total number of codes retrieved.
- The Diagnostic Trouble Code (DTC) and related code definition are shown in the lower section of the LCD display.



I/M MONITOR STATUS icons are not displayed when viewing enhanced DTCs.

In the case of long code definitions, or when viewing Freeze Frame data, a small arrow is shown in the upper/lower right-hand corner of the code display area to indicate the presence of additional information. Use the ⏶ and ⏷ buttons, as necessary, to view the additional information.

- The Scan Tool will display a code only if codes are present in the vehicle's computer memory. If no codes are present, a "No Enhanced DTC's are presently stored in the vehicle's computer" is displayed. Press the **ENTER/LD** button to return to the Toyota/Lexus Enhanced menu.



3. If more than one code was retrieved press the **DTC SCROLL** button, as necessary, to display additional codes one at a time.
   - Whenever the Scroll function is used to view additional codes, the Scan Tool's communication link with the vehicle's computer disconnects. To re-establish communication, press the **LINK** button again.
4. When the last retrieved DTC has been displayed and the **DTC SCROLL** button is pressed, the Scan Tool returns to the Toyota/Lexus Enhanced menu.
   - To view *additional* enhanced DTCs, repeat steps **1** through **4**, above.
   - To exit the enhanced mode, use the **UP** and **DOWN** buttons, as necessary, to select **Exit** from the Toyota/Lexus Enhanced menu, then press the **ENTER/LD** button. The Scan Tool returns to the OBD2 DTC screen.

ERASING DIAGNOSTIC TROUBLE CODES (DTCs)

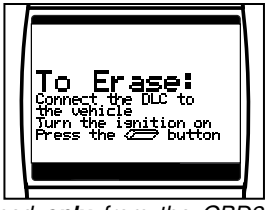
When the Scan Tool's ERASE function is used to erase DTCs from the vehicle's on-board computer, "Freeze Frame" data and manufacturer-specific enhanced data are also erased.

If you plan to take the vehicle to a Service Center for repair, **DO NOT** erase the codes from the vehicle's computer. If the codes are erased, valuable information that might help the technician troubleshoot the problem will also be erased.

Erase DTCs from the computer's memory as follows:

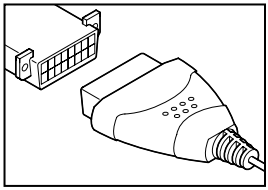
When DTCs are erased from the vehicle's computer memory, the I/M Readiness Monitor Status program resets the status of all Monitors to a not run "flashing" condition. To set all of the Monitors to a DONE status, an OBD2 Drive Cycle must be performed. Refer to your vehicle's service manual for information on how to perform an OBD2 Drive Cycle for the vehicle under test.

*The Scan Tool must be connected to the vehicle's DLC to erase the codes from the computer's memory. If you press the **ERASE** button when the Scan Tool is not connected to the vehicle's DLC, the erase instruction screen displays.*



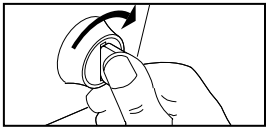
*The Erase function can be performed **only** from the OBD2 DTC screen. The Erase function **cannot** be performed while the Scan Tool is in "enhanced" mode.*

1. If not connected already, connect the Scan Tool to the vehicle's DLC, and turn the ignition "On." (If the Scan Tool is already connected and linked to the vehicle's computer, proceed directly to step 4. If not, continue to step 2.)



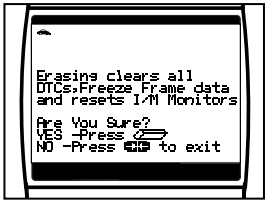
2. Turn the ignition on. **DO NOT** start the engine.

Press and release the **POWER/LINK** button to establish communication with the vehicle's computer.



3. Press and release the **ERASE** button. A confirmation message shows on the display.

- If you are sure you want to proceed press the **ERASE** button again to erase DTCs from the vehicle's computer.
- If you do not want to continue with the erase process, press the **POWER/LINK** button to exit the erase mode.



4. If you chose to erase DTCs, a progress screen displays while the erase function is in progress.

- If the erase was successful, a confirmation message shows on the display. Press the **DTC SCROLL** button to return to the DTC screen.
- If the erase was not successful, an advisory message shows on the display. Verify that the Scan Tool is properly connected to the vehicle's DLC and that the ignition is on, then repeat steps **2** and **3**, above.

Erasing DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem that caused the code(s) to be set are not made, the code(s) will appear again (and the check engine light will illuminate) as soon as the vehicle is driven long enough for its Monitors to complete their testing.

I/M READINESS TESTING

I/M is an Inspection and Maintenance program legislated by the Government to meet federal clean-air standards.

The program requires that a vehicle be taken periodically to an Emissions Station for an "Emissions Test" or "Smog Check," where the emissions-related components and systems are inspected and tested for proper operation. Emissions Tests are generally performed once a year, or once every two years.

On OBD2 systems, the I/M program is enhanced by requiring vehicles to meet stricter test standards. One of the tests instituted by the Federal Government is called I/M 240. On I/M 240, the vehicle under test is driven under different speeds and load conditions on a dynamometer for 240 seconds, while the vehicle's emissions are measured.

Emissions tests vary depending on the geographic or regional area in which the vehicle is registered. If the vehicle is registered in a highly urbanized area, the I/M 240 is probably the type of test required. If the vehicle is registered in a rural area, the stricter "dynamometer type" test may not be required.

I/M Readiness Monitors

I/M Readiness shows whether the various emissions-related systems on the vehicle are operating properly and are ready for Inspection and Maintenance testing.

State and Federal Governments enacted Regulations, Procedures and Emission Standards to ensure that all emissions-related components and systems are **continuously** or **periodically** monitored, tested and diagnosed whenever the vehicle is in operation. It also requires vehicle manufacturers to automatically detect and report any problems or faults that may increase the vehicle's emissions to an unacceptable level.

The vehicle's emissions control system consists of several components or sub-systems (Oxygen Sensor, Catalytic Converter, EGR, Fuel System, etc.) that aid in reducing vehicle emissions.

To have an efficient Vehicle Emission Control System, all the emissions-related components and systems must work correctly whenever the vehicle is in operation.

To comply with State and Federal Government regulations, vehicle manufacturers designed a series of special computer programs called "Monitors" that are programmed into the vehicle's computer. Each of these Monitors is specifically designed to run tests and diagnostics on a specific emissions-related component or system (Oxygen Sensor, Catalytic Converter, EGR Valve, Fuel System, etc.) to ensure their proper operation. Currently, there are a maximum of eleven Monitors available for use.

Each Monitor has a specific function to test and diagnose only its designated emissions-related component or system. The names of the Monitors (Oxygen Sensor Monitor, Catalyst Monitor, EGR Monitor, Misfire Monitor, etc.) describe which component or system each Monitor is designed to test and diagnose.

Emissions Inspection and Maintenance (I/M) Readiness

Monitor Status Information

I/M Readiness Monitor Status shows which of the vehicle's Monitors have run and completed their diagnosis and testing, and which ones have not yet run and completed testing and diagnosis of their designated sections of the vehicle's emissions system.

- If a Monitor was able to meet all the conditions required to enable it to perform the self-diagnosis and testing of its assigned engine system, it means the monitor "HAS RUN."
- If a Monitor has not yet met all the conditions required for it to perform the self-diagnosis and testing of its assigned engine system; it means the Monitor "HAS NOT RUN."

The Monitor Run/Not Run status does not show whether or not a problem exists in a system. Monitor status only indicates whether a particular Monitor has or has not run and performed the self-diagnosis and testing of its associated system.

Performing I/M Readiness Quick Check

When a vehicle first comes from the factory, all Monitors indicate a "HAVE RUN" status. This indicates that all Monitors have run and completed their diagnostic testing. The "HAVE RUN" status remains in the computer's memory, unless the Diagnostic Trouble Codes are erased or the vehicle's computer memory is cleared.

The Scan Tool allows you to retrieve Monitor/System Status Information to help you determine if the vehicle is ready for an Emissions Test (Smog Check). In addition to retrieving Diagnostic Trouble Codes, the Scan Tool also retrieves Monitor Run/Not Run status. This information is very important since different areas of the state/country have different emissions laws and regulations concerning Monitor Run/Not Run status.

Before an Emissions Test (Smog Check) can be performed, your vehicle must meet certain rules, requirements and procedures legislated by the Federal and state (country) governments where you live.

1. In most areas, one of the requirements that must be met before a vehicle is allowed to be Emissions Tested (Smog Checked) is that the vehicle does not have any Diagnostic Trouble Codes present (with the exception of PENDING Diagnostic Trouble Codes).
2. In addition to the requirement that no Diagnostic Trouble Codes be present, some areas also require that all the Monitors that a particular vehicle supports indicate a "Has Run" status condition before an Emissions Check may be performed.
3. Other areas may only require that some (but not all) Monitors indicate a "Has Run" status before an Emissions Test (Smog Check) may be performed.

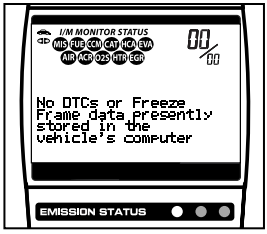
Monitors with a "Has Run" status indicate that all the required conditions they needed to perform diagnosis and testing of their assigned engine area (system) have been met, and all diagnostic testing has completed successfully.

Monitors with a "Has Not Run" status have not yet met the conditions they need to perform diagnosis and testing of their assigned engine area (system), and have not been able to perform diagnostic testing on that system.

The green, yellow and red LEDs provide a quick way to help you determine if a vehicle is ready for an Emissions Test (Smog Check). Follow the instructions below to perform the Quick Check.

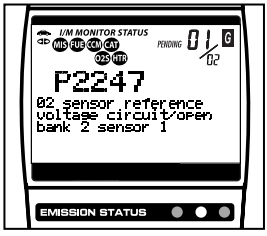
Perform the CODE RETRIEVAL PROCEDURE as described on page 22, then interpret the LED indications as follows:

Interpreting I/M Readiness Test Results

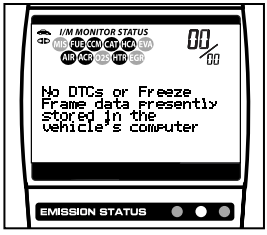

I/M MONITOR STATUS
MIS FUE CCM CAT HCA EVA
AIR ACR O2S HTR EGR
00
00
No DTCs or Freeze Frame data presently stored in the vehicle's computer
EMISSION STATUS

1. **GREEN LED** - Indicates that all engine systems are "OK" and operating normally (all Monitors supported by the vehicle have run and performed their self-diagnostic testing). The vehicle is ready for an Emissions Test (Smog Check), and there is a good possibility that it can be certified.

2. **YELLOW LED** - Determine from the CODE RETRIEVAL PROCEDURE (page 22) which of the two possible conditions is causing the yellow LED to light.



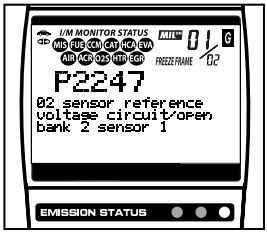
   - If a "PENDING" Diagnostic Trouble Code is causing the yellow LED to light, it is possible that the vehicle will be allowed to be tested for emissions and certified. Currently, most areas (states / countries) will allow an Emissions Test (Smog Check) to be performed if the only code in the vehicle's computer is a "PENDING" Diagnostic Trouble Code.


I/M MONITOR STATUS
MIS FUE CCM CAT HCA EVA
AIR ACR O2S HTR EGR
00
00
No DTCs or Freeze Frame data presently stored in the vehicle's computer
EMISSION STATUS

   - If the illumination of the Yellow LED is being caused by monitors that “have not run” their diagnostic testing, then the issue of the vehicle being ready for an Emissions Test (Smog Check) depends on the emissions regulations and laws of your local area.

- Some areas require that all Monitors indicate a "Has Run" status before they allow an Emissions Test (Smog Check) to be performed. Other areas only require that some, but not all, Monitors have run their self-diagnostic testing before an Emissions Test (Smog Check) may be performed.
- From the code retrieval procedure, determine the status of each Monitor (a solid Monitor icon shows Monitor "Has Run" status, a flashing Monitor icon indicates "Has Not Run" status). Take this information to an emissions professional to determine (based on your test results) if your vehicle is ready for an Emissions Test (Smog Check).

3. **RED LED** - Indicates there is a problem with one or more of the vehicle's systems. A vehicle displaying a red LED is definitely not ready for an Emissions Test (Smog Check). The red LED is also an indication that there are Diagnostic Trouble Code(s) present (displayed on the Scan Tool's screen). The Multifunction Indicator (Check Engine) Lamp on the vehicle's instrument panel will light steady. The problem that is causing the red LED to light must be repaired before an Emissions Test (Smog Check) can be performed. It is also suggested that the vehicle be inspected/repaired before driving the vehicle further.



If the Red LED was obtained, there is a definite problem present in the system(s). In these cases, you have the following options.

- Repair the vehicle yourself. If you are going to perform the repairs yourself, proceed by reading the vehicle service manual and following all its procedures and recommendations.
- Take the vehicle to a professional to have it serviced. The problem(s) causing the red LED to light must be repaired before the vehicle is ready for an Emissions Test (Smog Check).

Using the I/M Readiness Monitor Status to Confirm a Repair

The I/M Readiness Monitor Status function can be used (after repair of a fault has been performed) to confirm that the repair has been performed correctly, and/or to check for Monitor Run Status. Use the following procedure to determine I/M Readiness Monitor Status:

1. Using retrieved Diagnostic Trouble Codes (DTCs) and code definitions as a guide, and following manufacturer's repair procedures, repair the fault or faults as instructed.

2. After the fault or faults have been repaired, connect the Scan Tool to the vehicle's DLC and erase the code or codes from the vehicle's computer memory.

- See page 40 for procedures for ERASING DIAGNOSTIC TROUBLE CODES (DTCs) from the vehicle's on-board computer.
- Write the codes down on a piece of paper for reference before erasing.

3. After the erase procedure is performed, most of the Monitor icons on the Scan Tool's display will be flashing. Leave the Scan Tool connected to the vehicle, and perform a Trip Drive Cycle for each "flashing" Monitor:

Misfire, Fuel and Comprehensive Component Monitors run continuously and their icons will always be on solid, even after the erase function is performed.

- Each DTC is associated with a specific Monitor. Consult the vehicle's service manual to identify the Monitor (or Monitors) associated with the faults that were repaired. Follow the manufacturer's procedures to perform a Trip Drive Cycle for the appropriate Monitors.
- While observing the Monitor icons on the Scan Tool's display, perform a Trip Drive Cycle for the appropriate Monitor or Monitors.

If the vehicle needs to be driven in order to perform a Trip Drive Cycle, ALWAYS have a second person help you. One person should drive the vehicle while the other person observes the Monitor icons on the Scan Tool for Monitor RUN status. Trying to drive and observe the Scan Tool at the same time is dangerous, and could cause a serious traffic accident.

4. When a Monitor's Trip Drive Cycle is performed properly, the Monitor icon on the Scan Tool's display changes from "flashing" to "solid," indicating that the Monitor has run and finished its diagnostic testing.

- If, after the Monitor has run, the MIL on the vehicle's dash is not lit, and no stored or pending codes associated with that particular Monitor are present in the vehicle's computer, the repair was successful.
- If, after the Monitor has run, the MIL on the vehicle's dash lights and/or a DTC associated with that Monitor is present in the vehicle's computer, the repair was unsuccessful. Refer to the vehicle's service manual and recheck repair procedures.

The OBD2 Scan Tool is a special diagnostic tool that communicates with the vehicle's computer. The Scan Tool lets you view and/or "capture" (record) "real-time" Live Data. This information includes values (volts, rpm, temperature, speed etc.) and system status information (open loop, closed loop, fuel system status, etc.) generated by the various vehicle sensors, switches and actuators.

In effect the Scan Tool lets you view, in "real time", the same signal values generated by the sensors, actuators, switches and/or vehicle system status information used by the vehicle's computer when calculating and conducting system adjustments and corrections.

The real time (Live Data) vehicle operating information (values/status) that the computer supplies to the Scan Tool for each sensor, actuator, switch, etc. is called Parameter Identification (PID) Data.

Each PID (sensor, actuator switch, status, etc.) has a set of operating characteristics and features (parameters) that serve to identify it. The Scan Tool displays this information for each sensor, actuator, switch or status that is supported by the vehicle under test.

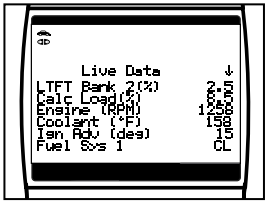
***WARNING**: If the vehicle must be driven in order to perform a troubleshooting procedure, **ALWAYS** have a second person help you. One person should drive the vehicle while the other person observes the Scan Tool data. Trying to drive and operate the Scan Tool at the same time is dangerous, and could cause a serious traffic accident.*

VIEWING LIVE DATA

1. Follow steps 1 through 7 of the CODE RETRIEVAL PROCEDURE (page 22) to place the Scan Tool in "Code Retrieval" mode.

2. Press and release the **ENTER/LD** button to place the Scan Tool in "Live Data" mode.

3. Real-time Live Data (PID) information supported by the vehicle under test displays.



Remember, what you are viewing is "real-time" Live Data. The values (volts, rpm, temperature, vehicle speed, system status etc) for the various PIDS displayed may change as the vehicle's operating conditions change.

4. A vehicle usually supports several PIDs, however, only a limited amount of PID data can be displayed on the screen at one time. If additional PID data is available, a small arrow will be shown on the display. Use the the **UP** and **DOWN** buttons, as necessary, to scroll up or down to view all available PID data.

- If communication with the vehicle is lost while viewing Live Data, a Communication Lost" message shows on the Scan Tool's display.

5. If you experience vehicle problems, view and/or compare the Live Data (PID) information displayed on the Scan Tool to specifications in the vehicle's repair manual.

*If desired, you can "customize" the Live Data display to show only those PIDs you are interested in viewing. See **Customizing Live Data (PIDs)** below for details. You may also choose to "capture" (record) Live Data for later viewing. See RECORDING (CAPTURING) LIVE DATA on page 49for details.*

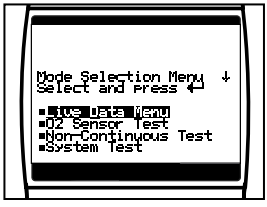
6. You can toggle back and forth between the DTC screen (to view DTCs) and Live Data screen (to view PIDs) by alternately pressing and releasing the **DTC SCROLL** and the **ENTER/LD** buttons once (the unit will stay linked to the vehicle while toggling between modes). If the **DTC SCROLL** button is pressed twice, then the screen will scroll to the next DTC and the tool will be taken out of link.

When toggling from the Live Data to the DTC screen a "one moment please..." message will temporarily display, followed by the DTC screen.

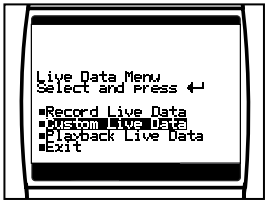
CUSTOMIZING LIVE DATA (PIDs)

This feature lets you customize the Scan Tool display to show only those PIDs that are of interest at the current time. You can customize the Live Data display by placing the Scan Tool in "Custom Live Data" mode and selecting only the PIDs that you wish to display. To customize the Live Data display, proceed as follows:

1. With the Scan Tool in "Live Data" mode (see VIEWING LIVE DATA on page 47 for details), press and hold the **ENTER/LD** button until the "Mode Selection Menu" appears.

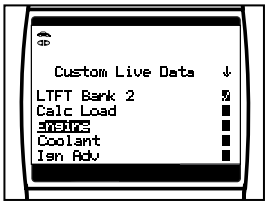


2. Use the **UP** and **DOWN** buttons, as necessary, to highlight "Live Data Menu", then press the **ENTER/LD** button.
   - The "Live Data Menu" displays.
3. Use the **UP** and **DOWN** buttons, as necessary, to highlight "Custom Live Data", then press the **ENTER/LD** button.



- The "Custom Live Data" menu displays, with the first PID in the menu highlighted.

4. Use the **UP** ⏶ and **DOWN** ⏷ buttons to scroll through the available PIDs. When the PID you wish to display is highlighted, press the **ENTER/LD** button to select it (a "checkmark" will show in the checkbox to the right of the PID to confirm your selection). Repeat the procedure until only the PIDs you want to display have all been selected.



- To deselect a currently selected PID, highlight the PID, then press the **ENTER/LD** button. The checkmark will be removed from the checkbox.

5. When you are finished making your selection(s), scroll to the end of the PID list and highlight the word DONE, then press the **ENTER/LD** button.
   - The Scan Tool is now in "Custom Live Data" mode. Only the PIDs you selected are shown on the Scan Tools display.
   - To toggle between the "Custom Live Data" display and the full Live Data display, momentarily press the **ENTER/LD** button.
6. To exit the "Custom Live Data" mode, press and hold the **ENTER/LD** button until the “Mode Selection Menu” displays.

RECORDING (CAPTURING) LIVE DATA

You can record and save several frames of Live Data information for each PID supported by the vehicle in the Scan Tool's memory. Recorded Live Data can serve as valuable information to help you in the troubleshooting of vehicle problems.

There are two ways that the Scan Tool can "record" Live Data:

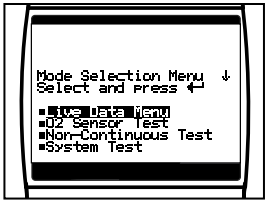
- Record by DTC Trigger
- Record by Manual Trigger

*If the **POWER/LINK** button is pressed at any time while in Live Data mode, any stored (recorded) Live Data will be cleared (erased) from the Scan Tool’s memory.*

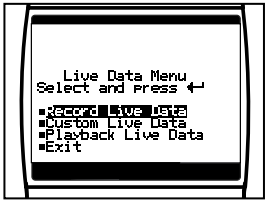
Record by DTC Trigger

This function automatically records (captures) Live Data information when a DTC sets and saves it in the Scan Tool’s memory. The recorded (captured) data can be a valuable troubleshooting aid, particularly if you are experiencing a fault that is causing a DTC to set.

1. With the Scan Tool in "Live Data" mode (see VIEWING LIVE DATA on page 47 for details), press and hold the **ENTER/LD** button until the "Mode Selection Menu" appears.



2. Use the **UP** and **DOWN** buttons, as necessary, to highlight “Live Data Menu”, then press the **ENTER/LD** button.
   - The "Live Data Menu" displays.

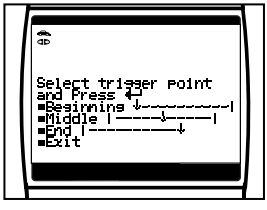


3. Use the **UP** and **DOWN** buttons, as necessary, to highlight “Record Live Data”, then press the **ENTER/LD** button.
   - The "Record Live Data Menu" displays.

4. Use the **UP** and **DOWN** buttons, as necessary, to highlight Record by DTC trigger, then press the **ENTER/LD** button.

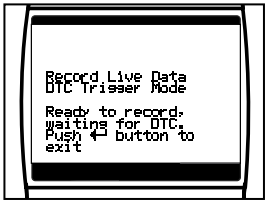
5. When the "Record by DTC Trigger" screen displays, select the desired trigger point as follows:

The Scan Tool is capable of recording approximately 20 frames of Live Data. Record by DTC trigger lets you select the point in time at which you wish the Scan Tool to begin recording Live Data. You can set the trigger point to record the 20 frames of data before an event (when the DTC sets), after the event, or in the middle (10 frames before and 10 frames after the event.

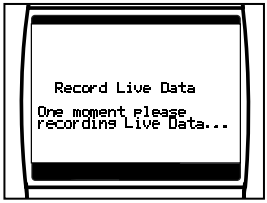


   - **Beginning** - records approximately 20 frames of Live Data after the DTC sets.
   - **Middle** - records approximately 10 frames of Live Data before and 10 frames after the DTC sets.
   - **End** - records approximately 20 frames of Live Data before the DTC sets.

6. Use the **UP** and **DOWN** buttons, as necessary, to select the desired trigger point, then press the **ENTER/LD** button.
   - A "One moment please. . ." message shows on the display. When the Scan Tool is ready to record Live Data, the "Record Live Data" screen displays.



7. Put the engine in the operating condition that causes the DTC to set.
   - If necessary, drive the vehicle until you reach the vehicle speed at which the problem occurs.
8. When the Scan Tool detects a fault that causes a DTC to set, it automatically records and saves approximately 20 frames of Live Data information in its memory (according to your trigger selection) for each PID supported by the vehicle.
   - All three LEDs will blink for three seconds to indicate that Live Data is being recorded, and a "One moment please..." message shows on the display.



   - When recording is complete, a confirmation screen displays, asking if you would like to view the recorded data. Use the **UP** ⓐ and **DOWN** ⓥ buttons, as necessary, to select Yes or No, as desired, then press the ENTER/LD button.

If Yes is selected, the Scan Tool enters "Playback" mode from which you can view a frame-by-frame playback of recorded Live Data (see LIVE DATA PLAYBACK on page 53 for details). If No is selected, the display returns to the "Live Data View" mode.

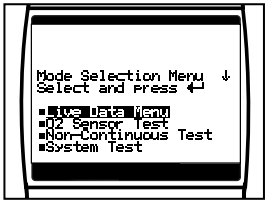
9. You can exit the "Record Live Data Mode" at any time by pressing and holding the **ENTER/LD** button until the "Mode Selection Menu" displays.

If desired, you can transfer the recorded Live Data information to a personal computer using the optional PC-LINK program (see instructions included with PC-Link for more information).

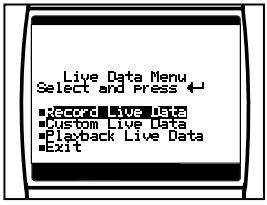
Record by Manual Trigger

This option lets you select the precise time at which the Live Data recording will occur. Record by Manual Trigger can be a very valuable diagnostic tool when troubleshooting intermittent problems that do not meet the requirements for a DTC to set. Even though a DTC is not present, the intermittent problems will sometimes manifest themselves briefly, for a few fractions of a second and/or only at certain vehicle speeds or vehicle operating conditions.

1. With the Scan Tool in "Live Data" mode (see VIEWING LIVE DATA on page 47 for details), press and hold the **ENTER/LD** button until the "Mode Selection Menu" appears.

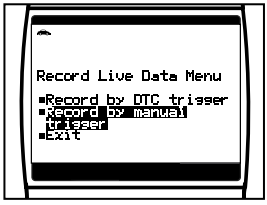


2. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight “Live Data Menu”, then press the **ENTER/LD** button.



- The "Live Data Menu" displays.

3. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight “Record Live Data”, then press the **ENTER/LD** button.



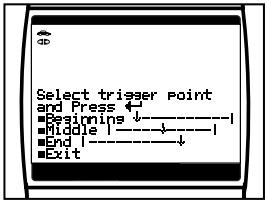
- The "Record Live Data Menu" displays.

4. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight “Record by manual trigger”, then press the **ENTER/LD** button.

5. When the "Record by Manual Trigger" screen displays, select the desired trigger point as follows:

The Scan Tool is capable of recording approximately 20 frames of Live Data. Record by DTC trigger lets you select the point in time at which you wish the Scan Tool to begin recording Live Data. You can set the trigger point to record the 20 frames of data before an event (when the DTC was set), after the event, or in the middle (10 frames before and 10 frames after the event.

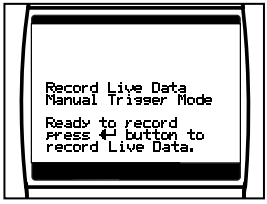
- **Beginning** - records approximately 20 frames of Live Data after the **ENTER/LD** button was pressed.
- **Middle** - records approximately 10 frames of Live Data before and 10 frames after the **ENTER/LD** button was pressed.



- **End** - records approximately 20 frames of Live Data before the **ENTER/LD** button was pressed.

6. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to select the desired trigger point, then press the **ENTER/LD** button.

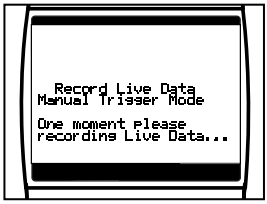
- A "One moment please. . ." message shows on the display. When the Scan Tool is ready to record Live Data, the "Record Live Data" screen displays.



7. Put the engine in the operating condition where the problem manifests itself.

- If necessary, drive the vehicle until you reach the vehicle speed at which the problem occurs.

8. When the problem occurs, press and release the **ENTER/LD** button.



- All three LEDs will blink for three seconds to indicate that Live Data is being recorded, and a "One moment please. . ." message shows on the display.
- When recording is complete, a confirmation screen displays, asking if you would like to view the recorded data. Use the **UP** and **DOWN** buttons, as necessary, to select Yes or No, as desired, then press the **ENTER/LD** button.

If Yes is selected, the Scan Tool enters "Playback" mode from which you can view a frame-by-frame playback of recorded Live Data (see LIVE DATA PLAYBACK on page 53 for details). If No is selected, the display returns to the "Live Data View" mode.

9. You can exit the "Record Live Data Mode" at any time by pressing and holding the **ENTER/LD** button until the "Mode Selection Menu" displays.

If desired, you can transfer the recorded Live Data information to a personal computer using the optional PC-LINK program (see instructions included with PC-Link for more information).

Important Information

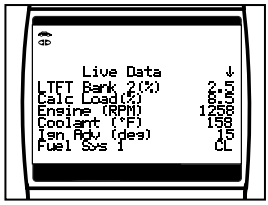
1. When Live Data capture is initiated, the green, yellow and red LEDs on the Scan Tool will flash three times to indicate that Live Data is being saved to the Scan Tool's memory.

2. When you are LINKED to a vehicle and you are in the “Live Data View mode”, you can toggle between “Live Data View” mode and “DTC view” mode by alternately pressing and releasing the **DTC SCROLL** or the **ENTER/LD** buttons. The Scan Tool will stay linked to the vehicle’s computer during this process. However, if the **DTC SCROLL** button is pressed twice the DTC screen will be advanced to the next DTC screen and the Scan Tool will be taken out of link.

LIVE DATA PLAYBACK

Once Live Data has been recorded, it is saved in the Scan Tool's memory. You can view recorded Live Data immediately after recording by selecting Yes from the Record Live Data confirmation screen (see RECORDING (CAPTURING) LIVE DATA on page 49 for more information), or you can view it later using the "Playback" function.

1. With the Scan Tool not connected to a vehicle, press the **POWER/LINK** button.
   - The "To Link" screen shows on the Scan Tool's display.
2. Press the **ENTER/LD** button to place the Scan Tool in "Live Data Playback" mode.
   - The display shows the recorded Live Data, beginning with the "trigger" frame.



When you select Yes from the Record Live Data confirmation screen, the Scan Tool enters the "Live Data Playback" mode, and the display shows the recorded Live Data, beginning with the "trigger" frame.

- A vehicle usually supports several PIDs, however, only a limited amount of PID data can be displayed on the screen at one time. If additional PID data is available, a small arrow will be shown on the display. Use the **UP** and **DOWN** buttons, as necessary, to scroll up or down to view all available PID data.
- When viewing recorded Live Data, look for any irregularities in any of the PID values/signal information (LTFT %, RPM, MAP, TEMP, etc.). If any PIDs are not within specification, or irregularities are detected, follow the procedures in the vehicle's service repair manual to perform additional troubleshooting and repair.

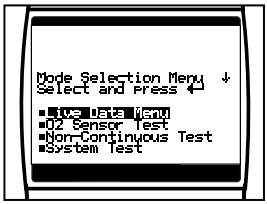
When recorded Live Data is played back, all available PIDs are shown, even if you have customized the Live Data selections.

*If there is no Live Data currently stored in the Scan Tool's memory, an advisory message shows on the display. Press the **DTC SCROLL** button to exit the "Live Data Playback" mode.*

3. When you have viewed all PID information for the current frame of Live Data, use the **DOWN** button to scroll to the end of the PID list. Highlight Next Frame or Previous Frame, as desired, then press the **ENTER/LD** button.
4. When you have finished viewing the recorded Live Data, exit the "Live Data Playback" mode using the appropriate procedure shown below:
   - If the Scan Tool is connected to a vehicle, use the **DOWN** button to scroll to the end of the PID list, highlight **Exit Playback**, then press the **ENTER/LD** button.
   - If the Scan Tool is not connected to a vehicle, press the **DTC SCROLL** button.

In addition to retrieving Diagnostic Trouble Code (DTC) and viewing Live Data, you can use the Scan Tool to perform additional diagnostic tests, and to view diagnostic and vehicle information stored in your vehicle's on-board computer.

Additional tests are accessed through the "Mode Selection Menu." To access the "Mode Selection Menu", place the Scan Tool in "Live Data" mode (see VIEWING LIVE DATA on page 47 for details), then press and hold the **ENTER/LD** button until the "Mode Selection Menu" appears.



The following functions are available from the "Mode Selection Menu":

- **Live Data Menu** - Displays the "Live Data Menu" from which you can choose to record, customize and play back Live Data (see the **Live Data Mode** section beginning on page 47 for more information)
- **O2 Sensor Test** - Retrieves and displays O2 sensor monitor test esults from your vehicle's on-board computer.
- **Non-Continuous Test** - Retrieves and displays test results for emission-related powertrain components and systems that are not continuously monitored.
- **System Test** - Performs a leak test for the vehicle's EVAP system.
- **Vehicle Information** - Retrieves the vehicle's VIN number, calibration ID(s) and other related information, and lets you view a listing of available modules for the vehicle.

O2 SENSOR TEST

OBD2 regulations require that applicable vehicles monitor and test operation of the oxygen (O2) sensors to identify problems that can affect fuel efficiency and vehicle emissions. These tests are performed automatically when engine operating conditions are within predefined limits. Results of these tests are stored in the on-board computer's memory.

The **O2 Sensor Test** function lets you retrieve and view O2 sensor monitor test results for the most recently completed tests from your vehicle's on-board computer.

Vehicles are equipped with multiple O2 sensors. O2 sensors are installed both upstream of (before) and downstream of (after) the exhaust system Catalytic Converters. The name of an O2 sensor identifies its location in the exhaust system. The name of each O2 sensor is made up of three parts:

O2S XX YY -or- **O2S X Y**

- **O2S** -this is the basic designation for all O2 sensors.

- **X** or **XX** - These characters identify the location of the O2 sensor in relation to a cylinder bank. An O2 sensor for cylinder bank 1 is identified by the designation “1” or "B1"; a sensor for cylinder bank 2 is identified as “2” or "B2."

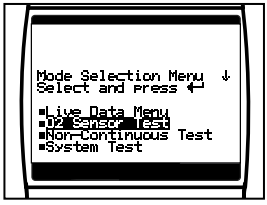
”Bank One” indicates the side of the engine where cylinder number one is located (V-type engines). Bank Two is opposite of Bank One.

- **Y** or **YY** - These characters identity the location of the O2 sensor in relation to the exhaust system catalyst. An O2 sensor located upstream of the catalyst is identified by the designation”1” or "S1", a sensor located downstream of the Catalytic Converter is identified as “2” or "S2."

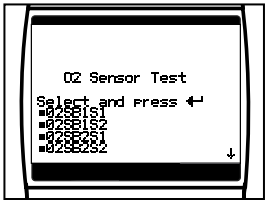
For example, **O2S12** or **O2SB1S2** is the designation for the downstream O2 sensor for cylinder bank 1.

The Scan Tool does not perform O2 sensor tests, but retrieves results from the most recently performed O2 sensor tests from the on-board computer's memory. You may retrieve O2 sensor test results for only one test of one sensor at any given time.

1. From the "Mode Selection Menu", use the **UP** ⓐ and **DOWN** ⓥ buttons, as necessary, to highlight **O2 Sensor Test,** then press the **ENTER/LD** button.

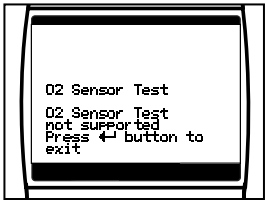


- The "Select Sensor" screen displays. The screen shows all O2 sensors applicable to the vehicle under test.



*If O2 sensor tests are not supported by the vehicle under test, an advisory message shows on the Scan Tool's display. Press the **ENTER/LD** button to return to "Live Data" mode.*

2. Use the **UP** ⓐ and **DOWN** ⓥ buttons, as necessary, to highlight the O2 sensor for which you wish to view test results, then press the **ENTER/LD** button.



3. A "One moment please..." message displays while the request is sent to the vehicle's on-board computer.

4. When test results have been retrieved, data for the selected sensor test will show on the Scan Tool's display.

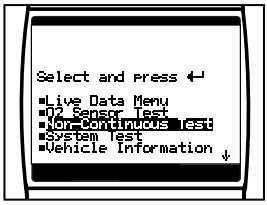
5. When you have finished viewing the retrieved test data, scroll to the end of the display to select **Exit**, then press the **ENTER/LD** button to return to the "Select Test" screen.

NON-CONTINUOUS TEST

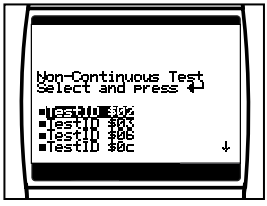
The **Non-Continuous Test** function retrieves and displays test results for emission-related powertrain components and systems that are not continuously monitored. The tests available are determined by the vehicle manufacturer.

The Scan Tool does not perform non-continuous test, but retrieves results from the most recently performed tests from the on-board computer's memory. You may retrieve non-continuous test results for only one test at any given time.

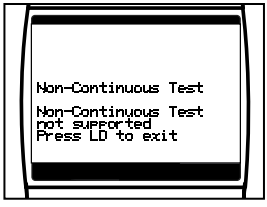
1. From the "Mode Selection Menu", use the **UP** and **DOWN** buttons, as necessary, to highlight **Non-Continuous Test**, then press the **ENTER/LD** button.



- The "Select Test" screen displays. The screen shows all tests applicable to the vehicle under test. Refer to the vehicle's service repair manual for information related to non-continuous tests.



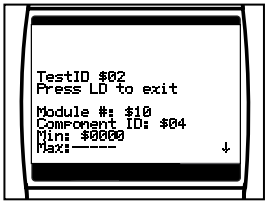
*If non-continuous tests are not supported by the vehicle under test, an advisory message shows on the Scan Tool's display. Press the **ENTER/LD** button to return to the Mode Selection menu.*



2. Use the **UP** and **DOWN** buttons, as necessary, to highlight the desired test, then press the **ENTER/LD** button.

3. A "One moment please. . ." message diplays while the request is sent to the vehicle's on-board computer.

4. When test results have been retrieved, data for the selected test will show on the Scan Tool's display. The display shows the following information:



- **Test ID** number
- **Module ID** number
- **Component ID** number
- **Min** or **Max** test limit

*Only one test limit, either **Min** or **Max**, is shown for any given test.*

- **Test Value** and status

*Status is calculated by the Scan Tool by comparing the **Test Value** against the displayed test limit (either **Min** or **Max**). Status is shown as either **Low**, **High** or **OK**.*

5. When you have finished viewing the retrieved test data, scroll to the end of the display to select **Exit**, then press the **ENTER/LD** button to return to the “Select Test” screen.

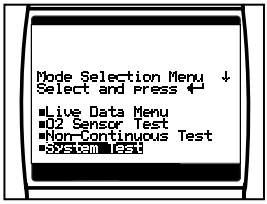
SYSTEM TEST

The **System Test** function lets you initiate a leak test for the vehicle's EVAP system.

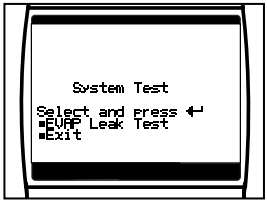
*The Scan Tool does not perform the leak test, but signals to vehicle's on-board computer to initiate the test. The vehicle manufacturer determines the criteria and method for stopping the test once it has been started. BEFORE using the **System Test** function, refer to the vehicle's service repair manual to determine the procedures necessary to stop the test.*

1. From the "Mode Selection Menu", use the **UP** and **DOWN** buttons as necessary, to highlight System Test, then press the **ENTER/LD** button.

- The "System Test Menu" displays.



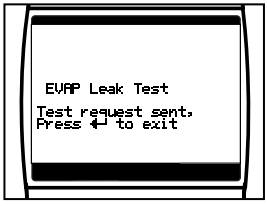
2. Use the **UP** and **DOWN** buttons, as necessary, to highlight EVAP Leak Test, then press the **ENTER/LD** button.



3. A "One moment please..." message displays while the request is sent to the vehicle's on-board computer.

*Some vehicle manufacturers do not allow Scan Tools or other external devices to control vehicle systems. If the **EVAP Leak Test** is not supported by the vehicle under test, an advisory message shows on the Scan Tool's display. Press the **ENTER/LD** button to return to the System Test menu.*

4. When the EVAP leak test has been initiated by the vehicle's on-board computer, a confirmation message shows on the Scan Tool's display. Press the **ENTER/LD** button to return to "Live Data" mode.



VEHICLE INFORMATION

The **Vehicle Information** function offers two options for retrieving reference information for the vehicle under test; **Vehicle ID** and **Available Modules**.

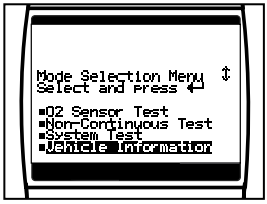
Retrieving Vehicle ID Information

The Vehicle ID function is applicable to model year 2000 and newer OBD2-compliant vehicles.

The Scan Tool can retrieve a list of information (provided by the vehicle manufacturer), unique to the vehicle under test, from the vehicle's on-board computer. This information may include:

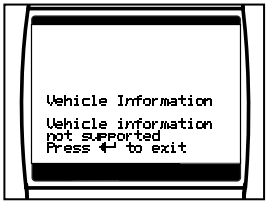
- The vehicle's VIN number
- The control module identification number
- The vehicle's calibration ID(s). These IDs uniquely identify the software version(s) for the vehicle's control module(s).
- The Vehicle's Calibration Verification Number(s) (CVNs) required by ODB2 regulations. CVNs are used to determine if emission-related calibrations for the vehicle under test have been changed. One or more CVNs may be returned by the vehicle's computer.

1. From the "Mode Selection Menu", use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight Vehicle Information, then press the **ENTER/LD** ↵LD button.



- The "Vehicle Information Menu" displays.

*If the **Vehicle Information** function is not supported by the vehicle under test, an advisory message shows on the Scan Tool's display. Press the **ENTER/LD** ↵LD button to return to the Mode Selection menu.*



2. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight Vehicle ID, then press the **ENTER/LD** ↵LD button.

3. A "One moment please..." message displays while the requested information is retrieved from the vehicle's computer.

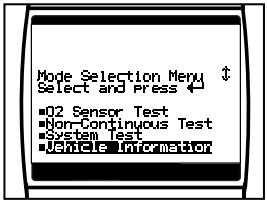
*The first time the **Vehicle ID** function is used, it may take several minutes to retrieve the information from the vehicle's computer.*

4. When the retrieval process is completed, the vehicle ID information is shown on the Scan Tool's display. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to view the entire list.
5. When you have finished viewing the retrieved vehicle ID information, press the **ENTER/LD** ↵LD button to return to "Live Data" mode.

Viewing Available Modules

The Scan Tool can retrieve a list of modules supported by the vehicle under test.

1. From the “Mode Selection Menu”, use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight Vehicle Information, then press the **ENTER/LD** ↵LD button.
   - The “Vehicle Information Menu” displays.



*If the **Vehicle Information** function is not supported by the vehicle under test, an advisory message shows on the Scan Tool’s display. Press the **ENTER/LD** ↵LD button to return to the “Live Data” mode.*

2. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to highlight Available Modules, then press the **ENTER/LD** ↵LD button.
3. A "One moment please..." message displays while the requested information is retrieved from the vehicle's computer.
4. When the retrieval process is completed, a complete list of modules supported by the vehicle under test is shown on the Scan Tool's display. Use the **UP** ⏶ and **DOWN** ⏷ buttons, as necessary, to view the entire list.
5. When you have finished viewing the list of available modules, press the **ENTER/LD** ↵LD button to return to "Live Data" mode.

The following is a list of Generic (Global) PIDs and their descriptions.

Tool Display	Unit	Value	PID Description
ACC Pedal D	%	XXX.X	Accelerator Pedal Position D
ACC Pedal E	%	XXX.X	Accelerator Pedal Position E
ACC Pedal F	%	XXX.X	Accelerator Pedal Position F
Air Status	-	UPS, DNS, OFF	Commanded Secondary Air Status
Ambient	*C / *F	XXX	Ambient Air Temperature
Aux Input Status	-	On / Off	Auxiliary Input Status
BARO	kPa /inHg	XXX / XX.X	Barometric Pressure
Calc LOAD	%	XXX.X	Calculated LOAD Value
CAT Temp 11	*C / *F	XXXX.X	Catalyst Temperature Bank 1-Sensor 1
CAT Temp 12	*C / *F	XXXX.X	Catalyst Temperature Bank 1-Sensor 2
CAT Temp 21	*C / *F	XXXX.X	Catalyst Temperature Bank 2-Sensor 1
CAT Temp 22	*C / *F	XXXX.X	Catalyst Temperature Bank 2-Sensor 2
Command EGR	%	XXX.X	Commanded EGR
Command EVAP	%	XXX.X	Commanded Evaporative Purge
Command TAC	%	XXX.X	Commanded Throttle Actuator
Dist DTC Clr	km /mile	XXXXX	Distance since DTC Cleared
Dist MIL ON	km /miles	XXXXX	Distance Traveled while MIL ON
ECT	*C / *F	XXX / XXX	Engine Coolant Temp
ECU Volts	V	XX.XXX	Control Module Voltage
EGR Error	%	XXX.X	EGR Error
Eng RPM	min	XXXXX	Engine RPM
EQ Ratio	-	X.XXX	Commanded Equivalence Ratio
EQ Ratio 11	-	X.XXX	Bank 1 - Sensor 1 Equivalence Ratio
EQ Ratio 12	-	X.XXX	Bank 1 - Sensor 2 Equivalence Ratio
EQ Ratio 13	-	X.XXX	Bank 1 - Sensor 3 Equivalence Ratio
EQ Ratio 14	-	X.XXX	Bank 1 - Sensor 4 Equivalence

Tool Display	Unit	Value	PID Description
			Ratio
EQ Ratio 21	-	X.XXX	Bank 2 - Sensor 1 Equivalence Ratio
EQ Ratio 22	-	X.XXX	Bank 2 - Sensor 2 Equivalence Ratio
EQ Ratio 23	-	X.XXX	Bank 2 - Sensor 3 Equivalence Ratio
EQ Ratio 24	-	X.XXX	Bank 2 - Sensor 4 Equivalence Ratio
EVAP Press	Pa /in H2O	XXXX.XX /XX.XXX	Evap System Vapor Pressure
FP / Vac	kPa /PSI	XXXX.XXX /XXX.X	Fuel Rail Pressure relative toVacuum
Fuel Level	%	XXX.X	Fuel Level Input
Fuel Press	kPa /PSI	XXX / XX.X	Fuel Rail Pressure
Fuel Press	kPa /PSI	XXXXX /XXXX.X	Fuel Rail Pressure
Fuel Sys 1	-	OL	Fuel System 1 Status
Fuel Sys 1	-	CL	Fuel System 1 Status
Fuel Sys 1	-	OL-Drive	Fuel System 1 Status
Fuel Sys 1	-	OL-Fault	Fuel System 1 Status
Fuel Sys 1	-	CL-Fault	Fuel System 1 Status
Fuel Sys 2	-	OL	Fuel System 2 Status
Fuel Sys 2	-	CL	Fuel System 2 Status
Fuel Sys 2	-	OL-Drive	Fuel System 2 Status
Fuel Sys 2	-	OL-Fault	Fuel System 2 Status
Fuel Sys 2	-	CL-Fault	Fuel System 2 Status
IAT	*C / *F	XXX / XXX	Intake Air Temperature
LOAD Value	%	XXX.X	Absolute Load Value
LTFT B1	%	XXX.X	Long Term Fuel Trim-Bank 1
LTFT B2	%	XXX.X	Long Term Fuel Trim-Bank 2
LTFT B3	%	XXX.X	Long Term Fuel Trim-Bank 3
LTFT B4	%	XXX.X	Long Term Fuel Trim-Bank 4
MAF	g/s ;l b/min	XXX.XX /XXXX.X	Air Flow Rate from Mass Air Flow Sensor
MAP	kPa /PSI	XXX / XX.X	Intake Manifold Absolute Pressure
MIL On Time	hrs, min	XXXX, XX	Engine Run Time while MIL ON
Monitor Status	-	ICONS on Display	Monitor Status this Driving Cycle
O2S B1 S1	V	X.XXX	Bank 1 - Sensor 1
O2S B1 S1	mA	X.XXX	Bank 1 - Sensor 1 O2S Current

Tool Display	Unit	Value	PID Description
mA			
O2S B1 S1 V	V	X.XXX	Bank 1 - Sensor 1 O2S Voltage
O2S B1 S2	V	X.XXX	Bank 1 - Sensor 2
O2S B1 S2 mA	mA	X.XXX	Bank 1 - Sensor 2 O2S Current
O2S B1 S2 V	V	X.XXX	Bank 1 - Sensor 2 O2S Voltage
O2S B1 S3	V	X.XXX	Bank 1 - Sensor 3
O2S B1 S3 mA	mA	X.XXX	Bank 1 - Sensor 3 O2S Current
O2S B1 S3 V	V	X.XXX	Bank 1 - Sensor 3 O2S Voltage
O2S B1 S4	V	X.XXX	Bank 1 - Sensor 4
O2S B1 S4 mA	mA	X.XXX	Bank 1 - Sensor 4 O2S Current
O2S B1 S4 V	V	X.XXX	Bank 1 - Sensor 4 O2S Voltage
O2S B2 S1	V	X.XXX	Bank 2 - Sensor 1
O2S B2 S1 mA	mA	X.XXX	Bank 2 - Sensor 1 O2S Current
O2S B2 S1 V	V	X.XXX	Bank 2 - Sensor 1 O2S Voltage
O2S B2 S2	V	X.XXX	Bank 2 - Sensor 2
O2S B2 S2 mA	mA	X.XXX	Bank 2 - Sensor 2 O2S Current
O2S B2 S2 V	V	X.XXX	Bank 2 - Sensor 2 O2S Voltage
O2S B2 S3	V	X.XXX	Bank 2 - Sensor 3
O2S B2 S3 mA	mA	X.XXX	Bank 2 - Sensor 3 O2S Current
O2S B2 S3 V	V	X.XXX	Bank 2 - Sensor 3 O2S Voltage
O2S B2 S4	V	X.XXX	Bank 2 - Sensor 4
O2S B2 S4 mA	mA	X.XXX	Bank 2 - Sensor 4 O2S Current
O2S B2 S4 V	V	X.XXX	Bank 2 - Sensor 4 O2S Voltage
O2S Location	-	O2S11	Oxygen Sensor, Bank 1, Sensor 1
O2S Location	-	O2S12	Oxygen Sensor, Bank 1, Sensor 2
O2S Location	-	O2S13	Oxygen Sensor, Bank 1, Sensor 3
O2S Location	-	O2S14	Oxygen Sensor, Bank 1, Sensor 4
O2S Location	-	O2S21	Oxygen Sensor, Bank 2, Sensor 1
O2S Location	-	O2S22	Oxygen Sensor, Bank 2, Sensor 1
O2S Location	-	O2S23	Oxygen Sensor, Bank 2, Sensor 3
O2S Location	-	O2S24	Oxygen Sensor, Bank 2, Sensor 4
O2S Location	-	O2S11	Oxygen Sensor, Bank 1, Sensor 1
O2S Location	-	O2S12	Oxygen Sensor, Bank 1, Sensor 2
O2S Location	-	O2S21	Oxygen Sensor, Bank 2, Sensor 1
O2S Location	-	O2S22	Oxygen Sensor, Bank 2, Sensor 2
O2S Location	-	O2S31	Oxygen Sensor, Bank 3, Sensor 1
O2S Location	-	O2S32	Oxygen Sensor, Bank 3, Sensor 2
O2S Location	-	O2S41	Oxygen Sensor, Bank 4, Sensor 1
O2S Location	-	O2S42	Oxygen Sensor, Bank 4, Sensor 2

Tool Display	Unit	Value	PID Description
OBD Support	-	OBD2	OBD Requirements
OBD Support	-	OBD	OBD Requirements
OBD Support	-	OBD and OBD2	OBD Requirements
OBD Support	-	OBD1	OBD Requirements
OBD Support	-	No OBD	OBD Requirements
OBD Support	-	EOBD	OBD Requirements
OBD Support	-	EOBD and OBD2	OBD Requirements
OBD Support	-	EOBD and OBD	OBD Requirements
OBD Support	-	EOBD, OBD and OBD2	OBD Requirements
OBD Support	-	JOBD	OBD Requirements
OBD Support	-	JOBD and OBD2	OBD Requirements
OBD Support	-	JOBD and EOBD	OBD Requirements
OBD Support	-	JOBD, EOBD and OBD2	OBD Requirements
PTO Status	-	On / Off	Power Take Off Status
Rel TPS	%	XXX.X	Relative Throttle Position
Spark Adv	deg	XX	Ignition Timing Advance #1 Cylinder
STFT B1	%	XXX.X	Short Term Fuel Trim-Bank 1
STFT B1 S1	%	XXX.X	Bank 1 - Sensor 1
STFT B1 S2	%	XXX.X	Bank 1 - Sensor 2
STFT B1 S3	%	XXX.X	Bank 1 - Sensor 3
STFT B1 S4	%	XXX.X	Bank 1 - Sensor 4
STFT B2	%	XXX.X	Short Term Fuel Trim-Bank 2
STFT B2 S1	%	XXX.X	Bank 2 - Sensor 1
STFT B2 S2	%	XXX.X	Bank 2 - Sensor 2
STFT B2 S3	%	XXX.X	Bank 2 - Sensor 3
STFT B2 S4	%	XXX.X	Bank 2 - Sensor 4
STFT B3	%	XXX.X	Short Term Fuel Trim-Bank 3
STFT B4	%	XXX.X	Short Term Fuel Trim-Bank 4
Time DTC Clr	hrs, min	XXXX, XX	Time since DTC Cleared
Time Since Start	sec	XXXX	Time Since Engine Start
TPS	%	XXX.X	Absolute Throttle Position
TPS B	%	XXX.X	Absolute Throttle Position B
TPS C	%	XXX.X	Absolute Throttle Position C

Tool Display	Unit	Value	PID Description
Veh Speed	km/h / mph	XXX / XXX	Vehicle Speed Sensor
Warm-up DTC Clr	-	XXX	# Warm-ups since DTC Cleared

GLOSSARY OF TERMS AND ABBREVIATIONS

CARB – California Air Resources Board

CCM – Central Control Module

Computer Control System – An electronic control system, consisting of an on-board computer and related sensors, switches and actuators, used to ensure peak performance and fuel efficiency while reducing pollutants in the vehicle's emissions.

DIY – Do-It-Yourself

DLC – Data Link Connector

Drive Cycle – An extended set of driving procedures that takes into consideration the various types of driving conditions encountered in real life.

Driving Condition – A specific environmental or operation condition under which a vehicle is operated; such as starting the vehicle when cold, driving at steady speed (cruising), accelerating, etc.

DTC(s) – Diagnostic Trouble Code(s)

EGR – Exhaust Gas Recirculation

EPA – Environmental Protection Agency

EVAP – Evaporative Emissions System

Fault Code – See DTCs

Freeze Frame – A digital representation of engine and/or emissions system conditions present when a fault code was recorded.

FTP – Fuel Tank Pressure

Generic Code – A DTC that applies to all OBD2 compliant vehicles.

I/M Readiness – An indication of whether or not a vehicle's emissions-related system are operating properly and are ready for Inspection and Maintenance testing.

I/M Test / Emissions Test / Smog Check – A functional test of a vehicle to determine if tailpipe emissions are within Federal/State/Local requirements.

LCD – Liquid Crystal Display

LED – Light Emitting Diode

LTFT – Long Term Fuel Trim, is a program in the vehicle's computer designed to add or subtract fuel from the vehicle to compensate for operating conditions that vary from the ideal A/F ratio (long term).

Manufacturer Specific Code – A DTC that applies only to OBD2 compliant vehicles made by a specific manufacturer.

MIL – Malfunction Indicator Lamp (also referred to as "Check Engine" light

OBD1 – On-Board Diagnostics Version 1 (also referred to as "OBD I")

OBD2 – On-Board Diagnostics Version 2 (also referred to as "OBD II")

On-Board Computer – The central processing unit in the vehicle's computer control system.

PCM – Powertrain Control Module

Pending Code – A code recorded on the "first trip" for a "two-trip" code. If the fault that caused the code to be set is not detected on the second trip, the code is automatically erased.

PID – Parameter Identification

STFT – Short Term Fuel Trim, is a program in the vehicle's computer designed to add or subtract fuel from the vehicle to compensate for operating conditions that vary from the ideal A/F ratio. The vehicle uses this program to make minor fuel adjustments (fine tune) on a short-term basis.

Trip Drive Cycle – Vehicle operation that provides the necessary driving condition to enable a vehicle Monitor to run and complete its diagnostic testing.

VECI – Vehicle Emission Control Information Decal

LIMITED ONE YEAR WARRANTY

The Manufacturer warrants to the original purchaser that this unit is free of defects in materials and workmanship under normal use and maintenance for a period of one (1) year from the date of original purchase.

If the unit fails within the one (1) year period, it will be repaired or replaced, at the Manufacturer's option, at no charge, when returned prepaid to the Service Center with Proof of Purchase. The sales receipt may be used for this purpose. Installation labor is not covered under this warranty. All replacement parts, whether new or remanufactured, assume as their warranty period only the remaining time of this warranty.

This warranty does not apply to damage caused by improper use, accident, abuse, improper voltage, service, fire, flood, lightning, or other acts of God, or if the product was altered or repaired by anyone other than the Manufacturer's Service Center.

The Manufacturer, under no circumstances shall be liable for any consequential damages for breach of any written warranty of this unit. This warranty gives you specific legal rights, and you may also have rights, which vary from state to state. This manual is copyrighted with all rights reserved. No portion of this document may be copied or reproduced by any means without the express written permission of the Manufacturer. THIS WARRANTY IS NOT TRANSFERABLE. For service, send via U.P.S. (if possible) prepaid to Manufacturer. Allow 3-4 weeks for service/repair.

SERVICE PROCEDURES

If you have any questions, require technical support or information on UPDATES and OPTIONAL ACCESSORIES, please contact your local store, distributor or the Service Center.

USA & Canada:

(800) 544-4124 (5:00 AM-6:00 PM, Monday-Friday PST)

All others: (714) 241-6802 (5:00 AM-6:00 PM, Monday-Friday PST)

FAX: (714) 432-7511 (24 hr.)

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